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D. C. Everest to Be Paper Group Executive

Appointment of Charles W. Boyce As Assistant Group Executive For Paper Section Also Is Announced—Pulp and Paper Exports Exceed All Records—Morton C. Tuttle Co. To Build New Mill.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 7, 1940—The appointments of D. C. Everest as group executive of the Pulp and Paper section of the National Defense Advisory Commission and of Charles W. Boyce as assistant group executive was announced today by Edward R. Stettinius Jr., head of the Industrial Materials Division. Mr. Everest is the president of the Marathon Paper Mills Company, Rothschild, Wis., and a former president of the American Paper and Pulp Association. Mr. Boyce is vice-president of the Northwest Paper Company, Cloquet, Minn., and formerly was executive secretary of the American Paper and Pulp Association.

Pulp and Paper Exports Reach Peak

Exports of wood pulp and paper from the United States in July exceeded all previous tonnage records, according to the Forest Products Division, Department of Commerce. The chief cause of the currently high pulp and paper shipments is the diversion of former trade with Europe to this country as a result of hostilities.

Exports of all classes of pulp, totaling 64,700 tons in July, were 57 per cent higher than in the previous month and 487 per cent higher than in the corresponding month of last year. The United Kingdom, Japan, and Australia were the chief customers, taking 35,200, 11,300 and 6,800 tons, respectively. Large increases in our shipments to South America, compared with last year, also marked the July trade.

Unbleached sulphate wood pulp exports during July, aggregating 24,300 tons, were the chief item shipped, with the United Kingdom being the chief purchaser of this pulp. Exports of this class of pulp showed the largest increase of any type. Exports of rayon and special grades of bleached sulphite totaled 14,000 tons, while shipments of other grades of bleached sulphite totaled 13,300 tons. Japan was the chief purchaser of the rayon grade of pulp. Other pulp exports were: unbleached sulphite, 8,000 tons; bleached sulphate, 4,200 tons; soda pulp, 800 tons, and all other classes, 800 tons.

Exports of paper and paper products in July, aggregating approximately 70,000 tons, were 10 per cent higher than in the previous month and 217 per cent higher than in the corresponding period of 1939. Since the outbreak of hostilities, paper exports have increased steadily. Purchases by countries formerly dependent upon European sources of supply largely account for the present high rate of exports. Chief items in the July export paper trade, by volume, were: paper board, straw board and container board; writing paper; kraft and other wrapping papers; newsprint paper; insulating and wall board.

St. Regis Improves Deferiet Mill

[FROM OUR REGULAR CORRESPONDENT]

DEFERIET, N. Y., September 10, 1940—A newly rebuilt Fourdrinier paper machine has been brought here from the old Raymondville plant of the St. Regis Paper Company and operations were started last week at the local branch. The new unit is able to produce about 900 feet of paper a minute which increases the production of the mill about 25 per cent. The machine has a width of 121 inches and is equipped with all modern features. It is a product of the Bagley & Sewall Company and was rebuilt by that concern. The building required several months and included the calender stack, new reel and winder. It will be used in the manufacture of catalogue paper and is a further step in the modernization of the local mill which has been going on for more than a year. Included in the modernization was the installation of the Chemipulp Process Company, Inc., of a system of more efficiently manufactured chemical pulps of better quality. This system was completed and placed in operation several months ago.

Tuttle Co. to Build St. Marys Mill

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., September 9, 1940—The Morton C. Tuttle Company, managers of construction and engineers, announce that they have been awarded a contract for the building of a pulp mill at St. Marys, Ga., for the Kraft Corporation, an outgrowth of the Gilman Paper Company, Gilman, Vt.

J. C. Kimberly to Be Chairman of Neenah Co.

Neenah Paper Co. Announces J. C. Kimberly Will Become Chairman of the Board and D. K. Brown President of the Firm—Farmers Purchase Lime Sludge From Kraft Mills—Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., September 9, 1940—Announcement was made Thursday of last week of the resignation of J. C. Kimberly as president of the Neenah Paper Company, Neenah, Wis. He will become chairman of the board.

His successor in the presidency is D. K. Brown, who has been vice-president and general manager. Kimberly Stuart has been elected vice-president, and Leo O. Schubart as secretary-treasurer. The directors, in addition to the officers, are John A. Kimberly and I. J. Stafford.

Mr. Kimberly has been president since the death of his father about fifteen years ago.

Young Men Run Embossing Plant

One of the youngest concerns in both organization and personnel in the converting field is Papercraft, Inc., 3869 N. Palmer St., Milwaukee, Wis. The president is Carl Buege, Jr., 22 years old. Lester Daliege, 21, is vice-president; Harry Reynolds, 27, is secretary, and Joseph Pepan, 22, treasurer.

The four young men met while studying printing at the Boys' Technical High School, Milwaukee, and later obtained jobs at the Leader Card Works. In January of this year they formed their own company, and now operate four presses embossing card stock for the printing and engraving trades.

Farmers Buying Lime Sludge

Lime sludge accumulated by the Mosinee Paper Mills Company, Mosinee, Wis., and the Tomahawk Kraft Paper Company, Tomahawk, Wis., both kraft mills, is being disposed of to farmers living in Marathon and Lincoln counties. Loading equipment has been set up by a trucker, who is delivering thousands of cubic yards to farm purchasers.

Weller-Miller Engagement

The engagement was announced last week of Arthur D. Weller of Stevens Point, Wis., and Miss Charlotte Miller, Miami, Fla. The wedding will take place at Miami this month. Mr. Weller is associated with the Whiting-Plover Paper Company at Stevens Point.

To Hold Open Industry Meeting

From the industry point of view, the outstanding feature of the program to be presented at the annual fall meeting of the National Paper Trade Association to be held at the Stevens Hotel, Chicago, September 23-25 is the open industry meeting to which manufacturers, guests and all members of the trade are invited which will be held Monday afternoon, September 23. This meeting is similar to that held last year for a review of conditions in all branches of the industry and a discussion of the outlook by representative manufacturers from the various manufacturing groups. We are informed that a report will be made on a set up which has been created for cooperation of the paper industry with the Council of National Defense. A number of prominent executives invited have consented to take part in this discussion which will also be participated in by a number of representative merchants.

The program for this meeting also includes the formal address of N.P.T.A. Counsel, J. K. Javits, whose wise, informative and suggestive discussion of National affairs and trade and economic problems is always received with the greatest interest.

Another feature of the program is an address before the Fine Paper Division by W. Floyd Maxwell, secretary of the Lithographers National Association, who will present an informative and stimulating discussion of the promotional activities of his organization illustrated by a film devoted to lithographic processes and the remarkable results obtained thereby. This presentation should be of outstanding interest and helpfulness to fine paper merchants whose business with the lithographic trade is steadily increasing in volume and importance.

Another noteworthy feature of the program is the address at the Wrapping Paper Division Meeting entitled, "Fishing in a Bath Tub," and described as a talk on creative selling by the well known sales specialist, Dave Colcord, Haskell, Oberlin Company, publishers of *Yourself Magazine*.

The results of the usual Mid-Year Survey for Fine, Wrapping and Dual houses will of course be presented and the regular sessions of the executive committee and the board of directors, as well as the formal semi-annual meeting of the association, are duly scheduled.

In view of the problems presented by the present Industry situation and the National Defense program, as well as the interest of the exhibits and other program features, it is expected that the attendance will be at least as large as has ever been registered at the association's fall convention.

Reliance Electric Opens New Sales Office

The Reliance Electric and Engineering Company is opening a sales office in Houston, Texas, with Frank A. Denison, Jr., as district manager, it is announced by James W. Corey, vice president in charge of sales.

A native Texan, Mr. Denison's home, prior to joining Reliance in July 1936, was Waco, Texas. He first attended the University of Texas, subsequently transferring to the University of Michigan where he graduated in mechanical engineering in 1936.

Mr. Denison goes to his new responsibilities in Houston from Reliance's Detroit office where he has been a member of the sales engineering staff since early 1937.

Tinkham Veale, in the sales service department of Reliance in Cleveland, succeeds Mr. Denison in Detroit.

Chicago Merchants Awaiting Market Upturn

Seasonal Quiet In Paper Trade Reported In Midwest Territory With Buyers Hesitant In Some Lines — Plans For N.P.T.A. Fall Convention Attracting Interest — Other Late Market News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., September 9, 1940—The Chicago paper market gives no evidence of that expected improvement in buying strength looked for after Labor Day. An under current of uncertainty is reported in most lines where mills are now considerably ahead of demand and where buyers are seemingly quite hesitant about stepping into the picture. The waste paper market displayed less strength in its September 1 quotations though reports indicate that no pronounced weakness became evident. Kraft papers were said to be in a less enviable position as mills reported curtailed production. Sulphites were not strong and the tone was not particularly encouraging. Books and covers held their ground all the way as, in fact, did virtually all lines where tremendous costs of production and the specter of raw material shortages combined to keep the market up to previous points. Groundwoods and newsprints moved slowly during the week with no marked development of general demand. The board market, particularly grades utilized in the building industry, gave a fairly good account of itself. Local markets continued to emphasize the lack of buying by jobbers who, in turn, acknowledged the fact that business, in general, was not putting all of its cards on the table for future plans.

Paper Men Appointed to Committee

Recent committee appointments released by the Chicago Association of Commerce indicate that paper and supply executives are continuing to play a prominent part in the affairs of Chicago. The Box Board Products division of the Association, for example, has E. P. Lannan of the Central Fibre Products Company, as its chairman. Other members of the division are R. H. Ritchie, W. C. Ritchie & Company, vice chairman; H. C. Baumgartner, Container Corporation of America; J. P. Brunt, Brunt & Company; Ace C. Fessenden, Ace Carton Corporation and George J. Kroeck, Kroeck Paper Box Company. The Paper and Envelopes division of the Association is again headed by John D. Swigart of the Swigart Paper Company with James M. Abell of the J. W. Butler Paper Company as vice chairman. Other members are R. E. Jones, Hobart Paper Company; J. Owen Lee, Great Lakes Paper Company; A. R. Martin, Bradner Smith & Company; C. Carr Sherman, H. P. Smith Paper Company and Harry A. Swigart of the Neostyle Company, Inc. Divisions covering the printing industries, lithographers, binders, photographers, engravers and electrotypers are also manned by men whose names are well known to the paper trade. Walter P. Paepcke, president of the Container Corporation of America, is a member of the board of directors.

N.P.T.A. Meeting to Have Many Exhibits

Chicago leaders of the paper trade who take a keen interest in the splendid work done by the National Paper Trade Association are reporting already that the Fall convention from September 23 to 25 will be the most successful in history. The idea of having joint sessions of manufacturers and distributors, tried out last year in a very successful way, is to be repeated again and local executives feel this effort to develop mutual understanding and stability in the industry will, in itself, help to swell attendance. The list of exhibitors is long and impressive and the program as reported thus far in this area indicates that those who do attend will get more than their money's worth.

Paper Milk Bottle "War" Continues

The paper milk bottle war still rages in Chicago with some complexities obviously up ahead. Early this week, despite the fact that the City Council denied the use of paper milk bottles in Chicago proper, the Dean Milk Company began to sell the products in the city. Sales were remarkably good and indicative of the public's interest in this type of container. A test case is expected when the City moves in to attempt to force the demands of the City Council. Meanwhile, advertising experts here doubt if any one product ever got as much advertising as the paper bottle has received and believe that when the product is ultimately approved it will have a tremendous buying urge in its favor.

New Dixie-Vortex Building

Construction of a six story fireproof addition to the plant of the Dixie-Vortex Company at 421 North Western Avenue is now under way according to E. R. Kirk, secretary of the company. Dixie-Vortex is likewise planning another addition at its Easton, Pennsylvania, plant. The two plant additions, to cost approximately $200,000, were necessary to provide for current expansion and increased volume of sales according to Mr. Kirk. The secretary of the leading paper cup and paper food container company pointed out that employment in the company was steadily going upward and would "probably continue to rise." The Chicago plant addition, he pointed out, would be used principally for the storage of finished goods. The Pennsylvania addition will be a three story building and the two will increase the floor space of the company by approximately 100,000 square feet.

Oppose Rate Reductions

Chicago trucking interests, including paper concerns who ship a great deal by truck, are crystallizing action to oppose the railroads in efforts to put into effect reductions in less than carload classifications comparable with those which became operative between points in the northern and southern states on September 1. A defense committee has been appointed to battle against spread of these "drastic rate reductions" into central territory. Motor freight carriers here are likewise opposing H.R.10398 which would place freight forwarders temporarily under federal regulation and would prevent motor carriers from engaging freely in the forwarding business.

News of the Philadelphia Paper Industry

Scott Paper Co. Holds Retail Salesmen's Meeting At Hotel Warwick and Introduces Two Types of Moulded-Plastic Towel Dispensers — Philadelphia Paper and Cordage Men At Tournament.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., September 9, 1940—The retail salesmen's divisional meeting of the Scott Paper Company, Chester, Pa., was held recently at the Hotel Warwick. Retail divisional managers and salesmen from the southern, Pittsburgh and Philadelphia attended the meeting.

At the morning session divisional managers, H. E. Brown, Pittsburgh, and Glenn Eisley, Philadelphia, acted as chairmen during the presentation of the company's new sales and advertising programs for the fall. The afternoon session was in charge of D. A. Prouty, retail sales manager, and was addressed by William F. Mohan, first vice-president of the company.

Introduces Plastic Towel Dispenser

Two types of completely moulded plastic towel dispensers for ScotTissue towels are now being leased by Scott Paper Company and its agents to customers desiring a delux type of towel dispenser. These attractive and durable dispensers are the result of an exhaustive and careful search by the makers of ScotTissue towels for a dispenser that would combine a deluxe appearance with utility.

The Scott Paper Company engineers have had experience with hundreds of thousands of towel dispensers, operating under all kinds of washroom conditions. Accordingly, they knew just what they wanted in a delux job. Many materials and designs were considered before the final selection was made. Dispensers moulded of bakelite and resinox were finally selected because these materials were inexpensive and their qualities appeared to meet all the washroom requirements.

The question of safety in shipping presented a problem. When first issued, the breakage during shipping amounted to 60 per cent, and seemed well destined to stop the use of these otherwise ideal dispensers. They were first shipped in ordinary cartons with a number of protective set-ins. Then the company tried wrapping them in corrugated sheets before boxing. Many other methods were tried, but breakage still threatened to kill the entire project. Finally, in collaboration with Container Corporation of America, a package was designed with a floating type of inner container. This has gone a long way toward solving the problem and breakages are now down to less than 3 per cent.

Cooperates with Defense Plan

The Johns-Manville Corporation, with a plant in New Jersey, notified its 10,000 employes some few days ago that any of them called for a year's military training under the proposed selective service or National Guard acts would be reemployed without loss of company benefits. During the peace-time training period, the company said it would keep up premium payments on life, health and group accident insurance carried through the concern.

Lewis H. Brown, president, asked employes to cooperate "to insure that no 'fifth column' activities shall in any way interfere with our company's service to the nation."

New Davey Office Building

The new office for the Davey Paper Company being erected on South Brandywine avenue, West Chester, adjoining the former building, is rapidly nearing completion. The side walls have been finished, window frames placed, and workmen are now finishing the roof.

Paper and Cordage Men Play Golf

The fifth in the series of golf tournaments of the Philadelphia Paper and Cordage Association, scheduled for Wednesday, August 28th at Aronomink Country Club, was postponed until Friday, September 6th because of weather conditions. There was a goodly turnout. It will be recalled that the Arthur Sherrill cup was put into competition for the first time, the conditions being that if any one won it three times, it would be retained by the winner, and the winner each time would be presented with an additional prize. J. P. Fluery of H. M. Gifford Mfg. Co. with a net of 66 was the lucky winner; he was also presented with an ornamental smoking stand. Mr. Buckley of American Paper Goods Co., Kensington, Conn., and Fred Hastings of American Writing Paper Co., were among the out of town guests who participated in this tournament.

The next tournament of the Philadelphia Paper and Cordage Association will be held Wednesday, September 18th, at Huntingdon Valley Country Club, Abington, Pa., with Frank O'Neill, Jr., as host. This will be the first time that members of the Association played this course, and a big turnout is expected. The prizes are both numerous and handsome, and already reservations are surpassing the expectations of E. L. Richards, chairman of the Golf Committee.

National Gypsum Orders at Peak

BUFFALO, N. Y., September 9, 1940—Announcing a United States government order for 5,000,000 feet of wallboard costing $180,000, Melvin H. Baker, president of the National Gypsum Co., reported today that operations in the company's 16 plants throughout the country now are the highest level in the concern's history.

Orders now on the books, Mr. Baker said, indicate that the present high rate will "continue until next Christmas." Employment in all of the plants has reached 4500, he said, also the best in the company's history.

"The upturn," he said, "is the result of general increase in public and private residential activity throughout the nation."

Canadian Container Firms Found Guilty

Nineteen Manufacturers of Containers and Container Materials Found Guilty In Judgment Which Imposed Fines From $2,500 To $10,000 — Most Paper Lines Improving — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 9, 1940—Nineteen manufacturers of containers and container materials were found guility September 6 at Osgoode Hall, Toronto, in a prosecution brought by the crown against them for violation of Section 498 of the Canadian Criminal Code by combining in restraint of trade. The firms who were found guility of combining in restraint of trade in a judgment issued by Justice J. A. Hope, of the Supreme Court of Ontario, were fined amounts of $2,500 to $10,000.

The case has been in the courts for some time and has been of widespread interest because of its possible bearing on other industries.

The accused companies are as follows: Container Materials, Ltd. and H. J. Badeen; Shipping Containers, Ltd.; Standard Paper Box, Ltd.; Martin-Hewitt Containers, Ltd.; Canadian Wirebound Boxes, Ltd.; Corrugated Paper Box Company, Ltd.; Gair Company, Canada, Ltd.; Hinde and Dauch Paper Company Canada, Ltd.; Hygrade Corrugated Products, Ltd.; Hilton Bros., Ltd.; Martin Paper Products, Ltd.; Canadian Boxes, Ltd.; Dominion Corrugated Paper Company, Ltd.; Acme Paper Box Company, Ltd.; G. W. Hendershot Corrugated Paper Company, Ltd.; Kraft Containers, Ltd.; Superior Box Company, Ltd.; Wilson Box Company, Ltd.; and Maritime Paper Products Company, Ltd.

Economic Activity Mounts

According to statistical institutions economic activity in Canada during the first seven months of 1940 showed marked expansion, compared with the same period of 1939, and the index of the physical volume of business, according to the Dominion Bureau of Statistics, rose nearly 19 per cent, averaging 138.6 during the period.

The improvement covers a wide range of industries, many of them only remotely or not at all connected with war work. The paper trade has come in for its share of this improvement, particularly the container manufacturers and those making the container materials. The great multiplicity of products and materials required for modern warfare is reflected in the acceleration of business among firms who supply packaging and shipping materials. The volume of business done by these ancillary war industries has shown a steady acceleration over the year, but more particularly during the last seven months, and since the war industries really got going. Moreover, it is confidently expected that as the mighty war effort being made by Canada gets further into its stride, the tempo of business all along the line will be stepped up to keep the pace. This shoulid, in turn, be reflected in improved conditions in the paper trade.

Most Paper Lines Improving

Casual conversations with paper trade executives in the Toronto area indicate that most lines are showing improvement and there is a stronger feeling of confidence in the future. Even those making tissues and small specialties report satisfactory improvement in business.

The second Canadian War Loan, in which $300,000,000 of new money is being asked for, went on sale this week, and may detract interest from the regular investment market, including the paper trade stocks and bonds, which have been fairly active. The bands are dated October 1, with a coupon rate of 3 per cent and were issued at 98.75, yielding 3.125 to maturity. The bonds are due Oct. 1, 1952, but may be called for redemption in whole or in part at 1pp and interest on or after Oct. 1, 1949. United States holders of the 4½ per cent bonds, which matured Sept. 1, may convert to the new issue, but no new money may be obtained in the United States market on account of the neutrality Act.

Stresses Salvage of Waste Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 12, 1940—Salvage of waste paper in England is now a matter of considerable importance. The authorities are constantly urging the public to cooperate in the saving of paper, cardboard, strawboard, brown wrapping paper, and boxes, according to a report from the American Consulate, Manchester, England. The difficulty has been mainly in the organization of its collection, but better progress has been reported in recent months in the Manchester area.

The declaration of war by Italy and the collapse of France rendered acute the shortage of supplies of tissues and other thin papers, since these specialties were imported to a large extent from these countries. Manufacturers of carbon paper have suffered from this shortage of thin base paper, and supplies of carbon paper are expected soon to become scarce and expensive.

An order forbidding the printing of new periodicals and newspapers and prohibiting news posters and contents bills advertising periodicals, etc., is expected to result in a considerable saving of paper, but it has at the same time brought further loss to the printing industry.

Record Pulpwood Cut This Year

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., September 9, 1940—There is great activity in the forestry industries in Canada, and preparations are going ahead for record cuts of pulpwood and lumber during the coming season. In addition to the demands of the pulp and paper industry orders for lumber are piling in from Great Britain, consequent on the cutting off of supplies from Scandinavia. Great Britain is looking to the Maritime Provinces to supply fit props for the mining industry and to British Columbia for large-size lumber.

Minimum Wage Hearing for Converted Paper to Be Held October 10

Industry Committee No. 14, investigating economic and competitive conditions in the converted paper products industry with a view to recommending a minimum wage, will hold a public hearing beginning 10 A.M. October 10, 1940, in the auditorium of the United States Department of Labor, Washington, D. C. The Committee of 27 members, equally representative of the public, the employers, and the employees, was called to Washington for the purpose of conducting a hearing by Wayne Lyman Morse, Dean of the Law School of the University of Oregon, who is chairman of the Committee.

Under the Fair Labor Standards Act, the Committee is authorized to recommend hourly minimum wage rates between 30 and 40 cents an hour inclusively.

Studying Industry for More Than Year

The Wage and Hour Division has been studying the paper industry for more than a year with a view to drawing appropriate definitions and appointing committees. The Committee members have been given a statistical study of the industry for perusal prior to the hearing. The industry, as defined, is carried on in some 2,300 establishments; its annual product is valued at about $1,000,000; it employs some 200,000 wage earners of whom about 30 per cent are women and girls. About 30,000 of the employees are now earning less than 40 cents an hour, the highest wage which the committee can recommend.

Persons who are interested in presenting material pertinent to the question under consideration are requested to file such application with Burton E. Oppenheim, Director of the Industry Committee Branch, Wage and Hour Division, U. S. Department of Labor, Washington, D. C., prior to October 2, 1940. This notice of intention to appear should contain the name and address of the person who wishes to appear, the name and address of the organization he represents, if any; a brief summary of the material which he will set before the group and the approximate length of time his presentation will take.

Testimony Taken Under Oath

Testimony is taken under oath and is subjected to cross examination by any interested person present. The record of the hearing will become a written exhibit at the separate hearing before the Administrator on the recommendation which the committee will make. The Administrator may accept the recommendation and issue a wage order or reject it, referring it back to the committee or to a new committee.

Written briefs of persons who cannot appear in person will be considered by the committee, provided that 35 copies are received by Mr. Oppenheim not later than October 4, 1940.

The members of the committee, who were appointed with due regard to the geographical regions in which such industry is carried on, are as follows:

For the Public

Wayne Lyman Morse, dean of the Law School, University of Oregon, Eugene, Ore. (Chairman); William E. Sinkin, Philadelphia; Dr. John A. Lapp, Chicago; Thomas L. Norton, professor of economics, University of Buffalo, Buffalo, N. Y.; Edgar M. Hoover, Jr., assistant professor of economics, University of Michigan, Ann Arbor, Mich.; Colonel William John Wilgus, engineer, Ascutney, Vt.; Tipton R. Snavely, professor of economics, University of Virginia, Charlottesville, Va.; Joseph M. Klamon, associate professor of economics, Washington University, St. Louis, Mo.; William Haber, professor of economics, University of Michigan, Ann Arbor, Mich.

For the Employers

H. M. Treen, Fort Wayne Corrugated Paper Company, Fort Wayne, Ind.; A. R. Leiserson, American Paper Company, Richmond, Va.; Norman Greenway, Robert Gair Company, New York; Allen K. Schleicher, F. J. Schleicher Paper Box Company, St. Louis, Mo.; Vasco Nunez, Nashua Gummed and Coated Paper Company, Nashua, N. H.; J. L. Coker, Sonoco Products Company, Hartsville, S. C.; Merritt J. Davis, President, Hammond Bag and Paper Co., Wellsburg, West Va.; Ralph Hayward, Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.; E. V. Johnson, U. S. Envelope Company, Springfield, Mass.

For the Employees

Boris Shishkin, American Federation of Labor, Washington, D. C.; John Sherman, vice-president, International Brotherhood of Pulp, Sulphite and Paper Mill Workers (A. F. of L.), Tacoma, Wash.; Earl Taylor, I.B.P.S.P.M.W. (A. F. of L.), Toledo, Ohio; Homer Humble, I.B.P.S.P.M.W. (A. F. of L.), Mobile, Alabama; Harriet Wray, I.B.P.S.P.M.W. (A. F. of L.), New York; C. V. Ernest, International Printing Pressmen and Assistants' Union of North America (A. F. of L.), Baltimore, Maryland; Frank Grasso, United Paper Workers Industrial Union (C.I.O.), New York; Burt J. Mason, U.P.W.I.U. (C.I.O.), Chicago; Ray Thomason, Regional Director, C.I.O., Richmond, Va.

South Africa Has Three Mills

There are three paper mills in the Union of South Africa, two of which are located a few miles from Johannesburg, Transvaal, and the third is in Durbin, Natal, according to a report from the office of the Commercial Attache, Johannesburg, South Africa. The largest and best equipped plant has two Fourdrinier machines over 170 feet in length, producing 104 inch widths with speeds up to 500 feet per minute. Another producing plant has a similar machine producing widths of 45 inches. Practically the only type of paper produced by the mills is kraft, industrial wrappings and a small amount of liner board. Figures on the annual productive capacity or annual production of paper and board from the mills in South Africa are not available. The productive capacity of the three plants is about 12,000 short tons of wrapping and board per annum.

Great Lakes Paper Co. Proves Success of New Timken Spring Mounted Drier Roll Bearing

By S. M. Weckstein[1]

The problem of providing for free axial float of one end of a drier roll in order to compensate for the expansion and contraction resulting from temperature changes has long been recognized as one that required an improved solution.

Realizing the possibility of dangerously high thrust loads being thrown into the bearing assemblies of this expansion, which in some cases may be as large as ½ inch, is not permitted to take place with a minimum of effort, and realizing also the importance of providing for misaligned conditions, The Timken Roller Bearing Company has developed a tending or front side bearing mounting which assures these conditions being properly handled. This is accomplished with the bearing itself definitely located within the bearing housing.

The bearing assembly itself, Fig. 1, as applied to the Great Lakes Paper Company's 304 inch machine, consists of two single row bearings separated by means of a cup spacer and adjusted by means of thin metal shims between the end plate and roll journal. The bearings may be adjusted on the journal to their proper running clearance and the bearing housing (A), Fig. 3, assembled later. The cones are mounted on the shaft with a tight press fit and the cups are a loose fit in the housing. Upon assembly the cups are clamped into the housing by means of the two closure plates. A combination flinger and annular groove closure is incorporated, and provision is made for a circulating oil system.

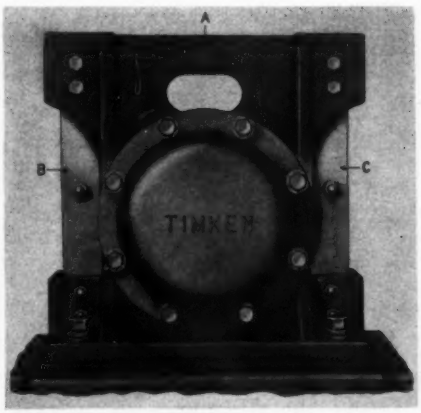


FIG. 3.

Fig. 2 illustrates alternate mountings that may be used, which, under some circumstances, may have certain advantages in facilitating assembly and securing bearing adjustment. The design above the centerline shows a standard DO type bearing consisting of a double cup and two single cones. Adjustment is obtained by the same method as is used in the case

[1] Chief Engineer, Industrial Division, The Timken Roller Bearing Co.

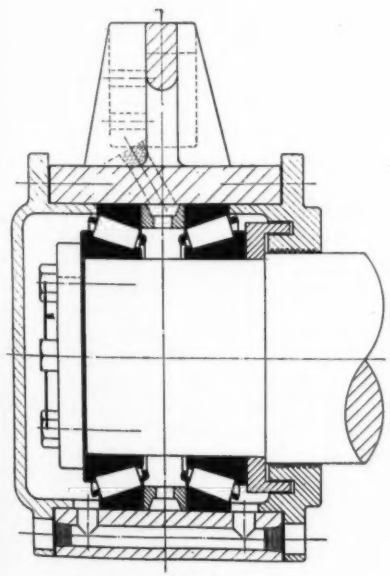


FIG. 1.

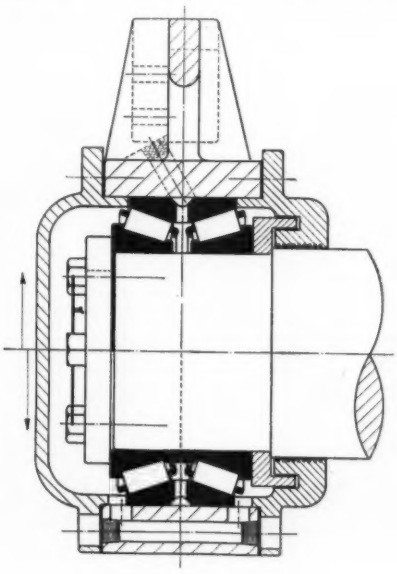


FIG. 2.

of the single row bearing. The annular groove and drilled holes through the cup convey the lubricant to within the bearing. Below the centerline a standard NA or non-adjustable bearing is shown. This bearing is made up of a double cup and two single row cones. The cones, however, are ground to exactly predetermined lengths so that when they are assembled into the cup the front faces of the cones butt together and the correct running clearance thus is established. The end plate is simply pulled up tightly by means of studs, and the bearing, correctly adjusted, is securely clamped to the roll journal. Both the DO and NA type bearing assemblies may be assembled on the journal and the bearing housing assembled later.

The feature of this new mounting is the method that is used in supporting the bearing box (A). Two assemblies of vertical laminated shims (B & C), Fig. 3, are incorporated, their upper ends being rigidly fastened to the slotted ears in the bearing box and their lower ends being rigidly held in similar ears in the base plate. Each assembly of the laminated springs has its ends ground square. At the ends of the springs, the width is also ground to the exact width of the slotted ears in both the bearing box and base. This assures equal distribution of loads on the spring ends. The load is not carried on the bolts clamping the springs to the housings. The springs are always in compression. The flexibility of the spring assembly can be adjusted or controlled by the bolt located in the center and on the neutral axis of the spring assembly. On the Great Lakes Paper Company's 304 inch machine, it was desirable to set the bolt with 1/32 inch end play.

The mounting is assembled on the machine so that when the drier rolls are cold the springs flex inward an amount equal to the expansion that will take place when the machine is up to running temperature. The assembled position of the mounting is illustrated by Fig. 4. Thus, when the drier is in operation, the springs will assume an erect position as illustrated in Fig. 5, and thereby act as columns to support the vertical load.

From observing exhaustive laboratory tests and also the operation of this mounting over a period of almost two years on the North American Continent's largest paper machine, Fig. 6, at the Great Lakes

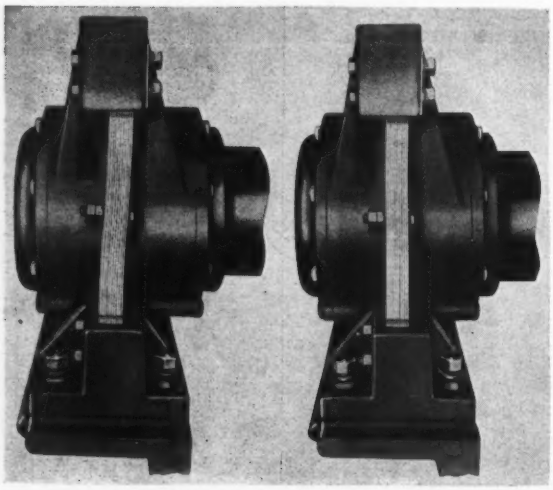


Fig. 4.

Fig. 5.

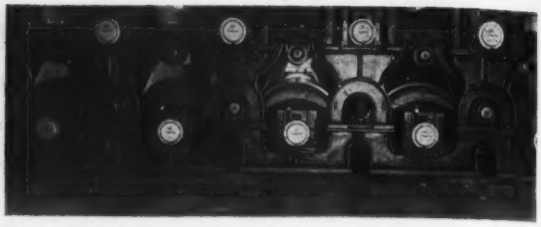


Fig. 6.

Paper Company, Fort Williams, Ont., it has definitely proved itself capable of overcoming every difficulty and of performing satisfactorily under every operating condition. It is, of course, only necessary to use this mounting on the tending or front side of the machine. The drive end of the roll should be supported by a conventional Timken self-aligning bearing mount. While this latter unit does align itself freely, it will also definitely fix the roll against axial motion and also maintain the proper alignment and spacing of gears or sprockets.

The circulating oil system introduces oil at the top of the box and between the two bearings. The oil, therefore, flows through the bearing at the bottom, thus furnishing all working elements with an ample supply of lubricant. The principal requirement is that sufficient oil be forced through the bearings to keep them cool. This quantity should also be sufficient so as to eliminate any possibility of the oil breaking down, or carbonizing due to high temperature. Consequently, no oil should be permitted to collect in the bearing box and accordingly two drains have been placed in the bottom of the housing, each of which are of the same size as the inlet pipe. This will assure the oil being quickly drained off as it emerges from the bearing. It is further recommended that the circulating oil system be supplemented by an oil filter and cooler. The oil proper should have a viscosity of 125 seconds to 150 seconds at 250 deg. F. (Saybolt Universal). The flash point should be 500 deg. F. minimum, the oil should show clean on a gasoline test and should have a neutral action.

In regard to the power requirements of a drier section equipped with Timken bearings as against a drier section of practically the same size that is on plain bearings, it was found that the breakaway demand showed a 4:1 ratio in favor of the Timken bearing equipped machine and that the overall power saving was in the neighborhood of 20 per cent.

Expect Pulp from Finland

[FROM OUR REGULAR CORRESPONDENT]

Albany, N. Y., September 10, 1940—Importers of this section anticipate the arrival of a cargo of wood pulp this month from Petsamo, northern port of Finland. Other Scandinavian ports have been closed owing to the blockade of waters adjacent to Great Britain. It was also announced at the local port that two vessels carrying pulp from Petsamo arrived at New York harbor this week. It was stated that pulp stocks in storage at the local port have been lowered considerably but increased production of Canadian and domestic mills so far has kept the industry supplied. While newsprint prices have been reaffirmed at $50 a ton the prices of other papers have been increased in recent months.

SPECIALIZATION — Doing one thing as well as it can possibly be done.

A RUBBER COVERED ROLL is only one item in the vast array of equipment needed to make paper.

A COMPLETE technical staff and the most modern manufacturing facilities of Stowe-Woodward are devoted to the making of better Rubber Covered Rolls.

STOWE-WOODWARD, INC. NEWTON UPPER FALLS · MASS.

NEW YORK OFFICE · WOOLWORTH BLDG.

Stowe-Woodward Rolls are made on the West Coast by HUNTINGTON RUBBER MILLS, INC., Seattle, Washington

Makers of **WHITE STAR** *Rubber Covered Rolls,* **TANNITE** *Couch Rolls*
STONITE *Top Press and Smoothing Rolls—All by the* **COREWELD** *Process*

Indianapolis Demand Expands

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., September 9, 1940—With a change to cooler weather, demand for most grades of paper and paper products showed a slight increase during the last fortnight. Demand is normal in most respects, though the jobbers are not inclined to be over optimistic. Prices are being firmly held in practically all items. Some of the mills in this area have curtailed their production slightly, but this was due to the fact, according to executives, that their production during the summer had been slightly above sales for each month and warehouse stocks have been built to satisfactory proportions, at least until a definite trend for fall has been determined.

In preparation for the opening of the school season, the demand for fine papers showed some slight increase during the last week. Printers say there is considerable work in prospect, but they continue to buy only for immediate needs.

Building paper demand continues heavier than it has been for years. The torrid weather of a month ago failed to slow building at all and the outlook for the fall season is brighter than in a decade. Stocks in the hands of retailers are not large, but they are well balanced and they are ready buyers for current needs. Prices, while firm, have shown no tendency toward a runaway market and every effort is being made to keep them in line to encourage construction as much as possible.

This is true of all the other materials entering the industry.

Though cooler weather has arrived the Labor Day is past, demand for summer specialties continued this week, but in slightly smaller volume. Dealers are being very careful in their buying and the carryover this fall will be small. Tissues are in good demand and kraft is holding is own.

Paper bag and wrapping paper also are said to be moving nicely.

Box manufacturers report steady sales and have curtailed their production from the high peak of the summer when they were making more than they were selling.

Both waste paper and rags are off somewhat in demand and prices are slightly softer than they have been, but the decline has been small.

Pulp Mills at Tallinn Stop Production

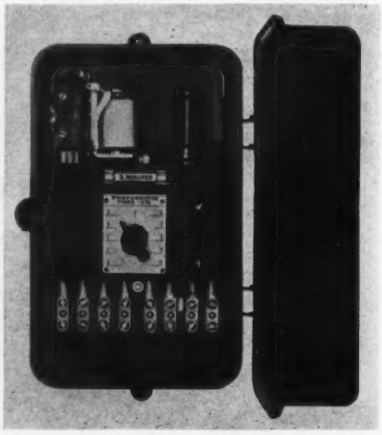
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 12, 1940—Management of the Northern Pulp and Paper Mills at Tallinn has notified the Ministry of Economic Affairs that the plant's production of chemical woodpulp has not been utilized because of the lack of export possibilities and that present stocks on hand amount to 10,000 metric tons, which in two weeks will reach 13,000 tons, according to a report from the American Consulate General, Tallinn, Estonia. As no export possibilities are in prospect, the company decided to stop production. Its 870 workers will be granted 6 weeks leave, two of which will be with pay. About 100 workers will be kept on for certain renovation and repair work in the plant. By being given payless vacations the workers are enabled to remain under the sickness insurance and other workers' privileges.

Photoswitch Short Interval Timer

Photoswitch Electronic Timer Type T15 is a universal interval timer, extremely accurate over ranges from 1/20th of a second to two minutes. Control is accomplished through a specially designed snap-action relay of 1,000 watts capacity, which results in an accuracy hitherto unapproached in simple and rugged timers.

The equipment is flexible with reference to actuating control, permitting both momentary push button and sustaining contacts control. It is universal for six timing ranges represented by timing valves snapped into a readily accessible clip.



NEW PHOTOSWITCH ELECTRONIC TIMER

Timer Type T15 has been designed with an accuracy permitting complete interchangeability of equipment. Thus, machine process calibrations for one timer apply to all timers.

The unit has been designed throughout for an unlimited life which is guaranteed to match that of any machine to which it is applied. The Photoswitch Short Interval Timer is made by Photoswitch Inc., 21 Chestnut Street, Cambridge, Mass.

Will Not Affect Newsprint Exports

VANCOUVER, B. C., August 31, 1940—British Columbia newsprint exporters do not expect to suffer any net loss in sales to Australia as a result of the proposed new paper rationing program in the Commonwealth.

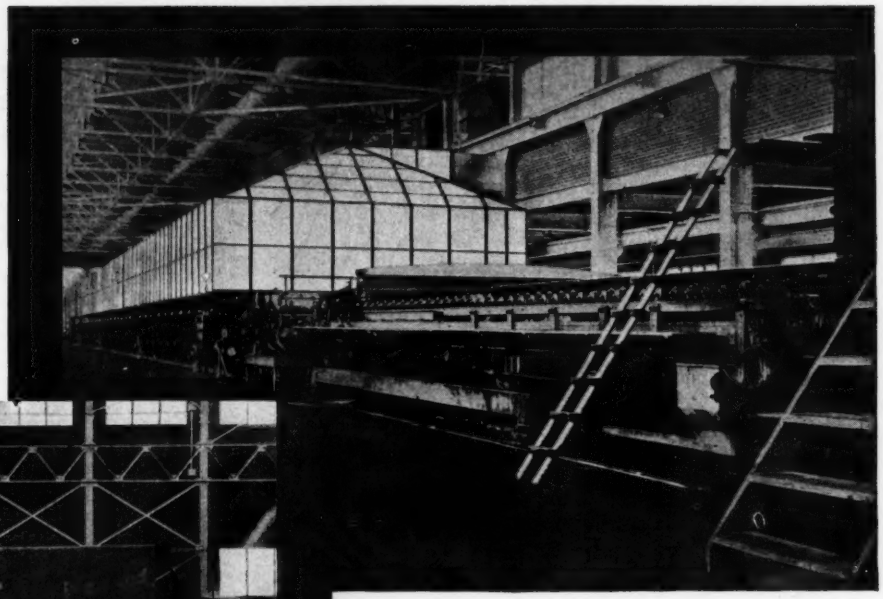
Present indications are that Australia will reduce consumption of paper under government regulations by 25 to 30 per cent. This would be a severe reduction in British Columbia's shipment were it not for the fact that the United Kingdom, which normally supplies Australia with about 40 per cent of its paper requirements, is unable to maintain its exports.

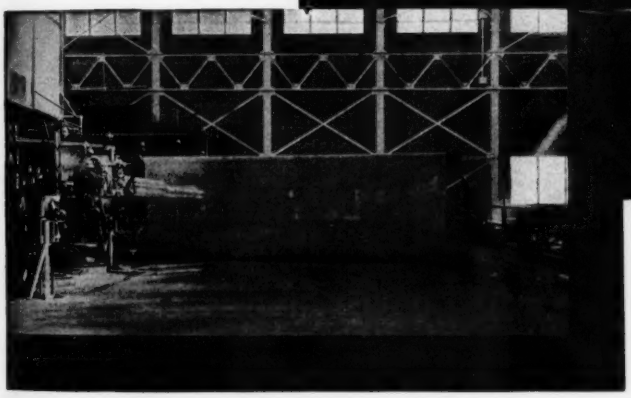
British Columbia mills, which supply about one quarter of Canada's paper sales to Australia, expect to be compensated for any loss due to Australia's rationing by the increase in sales due to the elimination of the United Kingdom from that market.

Australia's newsprint mill in Tasmania will go into production some time in October, according to present plans. The Powell River Company and the Pacific Mills Ltd., two B. C. companies, will supply the new Australian plant with about 7000 tons of pulp annually to use as a base for its own newsprint production.

THE BELOIT

Removable Fourdrinier





● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

● All wire poles are mounted in carriage before loop is formed. Inside poles are inserted inside the wire.

● Safest — most convenient — quickest method of installing Fourdrinier wire.

THE BELOIT WAY BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS. U.S.A. **IS THE MODERN WAY**

New Type of Fork Truck

The Elwell-Parker Electric Company, Cleveland, has brought out a new type of fork truck, ERS-3T, capable of elevating loads on skids or pallets to three levels instead of one. The elevating mechanism is built in three telescoping sections. When uprights are completely lowered, the forks just clear the floor. At the operator's will, forks can be raised to 50½ inches on the first lift, to 88½ inches on the second, and to 112 inches on the third. The rate of upward travel is 20 feet per minute with a 1500 pound load.

With telescoping members lowered, the overall height of the truck is but 74 inches. Thus the loaded truck can pass through doorways or beneath low overhanging pipes or conveyor systems.

The main driving motor is an Elwell-Parker 4-pole, series wound, capable of sustaining a 500 per cent overload. It is direct-connected to a free-coasting worm and gear, and drives the two wheels nearest load, assuring ample traction. Power source can be either acid or alkaline storage batteries. No fuses are needed to protect motor. When lowering load, regenerated power is returned to the battery.

The hoist is operated by a separate motor controlled by push-button. It may be tilted 15 degrees backward or 5 degrees forward from vertical. The two hoist chains have a safety factor of 9 and either will handle the load. Vertical uprights and tilt gearing are designed to prevent sidesway.

The hoist is provided with rachet device, which operates when the descending load meets an obstruction. A slip clutch serves the same purpose when ascending loads are obstructed. A solenoid brake locks the hoist load in any position. Fork arms of truck are supplied in a variety of dimensions to suit application.

Two wheels farthest from load are steered by handwheel. Drive wheels are 15 inches in diameter and 5 inches wide. Trail wheels are same diameter, 3½ inches wide. Added security and comfort to the operator are provided by a rubber-padded back rest and rubber-cushioned pedal pads.

Gilbert Puts Out New Sales Campaign

A sales-promotional campaign for the 1940-41 season which is described as one of the most forceful ever put out by a fine paper mill was presented to paper merchants by the Gilbert Paper Company. The campaign is titled "The Gilbert 12-Pay Sales-Promotion Plan", and is built around the idea of developing sales for the merchant during each month of the year. A new piece of sales-promotion material will be released each month, enabling salesmen to make worthwhile calls. The first unit in the new campaign is being released for distribution in September.

The distinctive type of advertising for which Gilbert has become noted will be continued under the plan. Large space units in such publications as "Fortune" and "Paper Progress" again will be used, with "Business Week" to be added to the schedule starting in January.

The plan includes a series of 12 "Blotters of the Month", each blotter featuring a merchant selling message, a calendar, a "Brainteaser" to sustain interest, a letterhead design, two human interest quotations and a "Story of the Month" designed to get a smile. Space for imprinting the merchant's own name is provided.

A new selling kit for salesmen also is a feature of the plan. In this, the course of the cotton used in the manufacture of Gilbert Cotton-Fiber Content papers is traced by pictures and captions from the fields to the finished product. An actual boll of cotton serves as the presentation's starting point.

As a feature of a "Letterhead of the Month" contest, prizes of $10.00 each are to be awarded to the printer-salesmen who sell the Gilbert paper on which the winning letterheads are printed.

The entire campaign consists of nine attractive units including issuing of the Gilbert calendar; a letterhead book; unusual product-selling pieces, and continued publication of the "Gilcrafter", a combination magazine and sample book distributed to 45,000 paper prospects. Meldrum & Fewsmith, Inc., Leader Building, Cleveland, prepared the campaign for Gilbert.

Price of Paper Not Discussed

E. W. Tinker, secretary of the American Paper and Pulp Association, early this week issued the following statement which is self explanatory:— "During the past ten days several companies have made inquiry indicating that in the paper trade an impression has been created that the price of paper was discussed with representatives of the Advisory Commission to the Council of National Defense at the meeting in New York on July 23, 1940. I believe this impression was gained from publicity emanating from Washington. The entire discussion in so far as prices are concerned revolved around the situation with relation to pulp supplies and not paper. However, it was generally acknowledged by the representative of the Price Stabilization Division of the Advisory Commission to the Council of National Defense and industry representatives that present prices of paper were not based upon existing costs and that an adjustment upward might naturally follow as present inventories were exhausted. I am sure the misinformation that seems to be prevalent was the result of a failure to distinguish between pulp and paper in Washington publicity that followed the meeting."

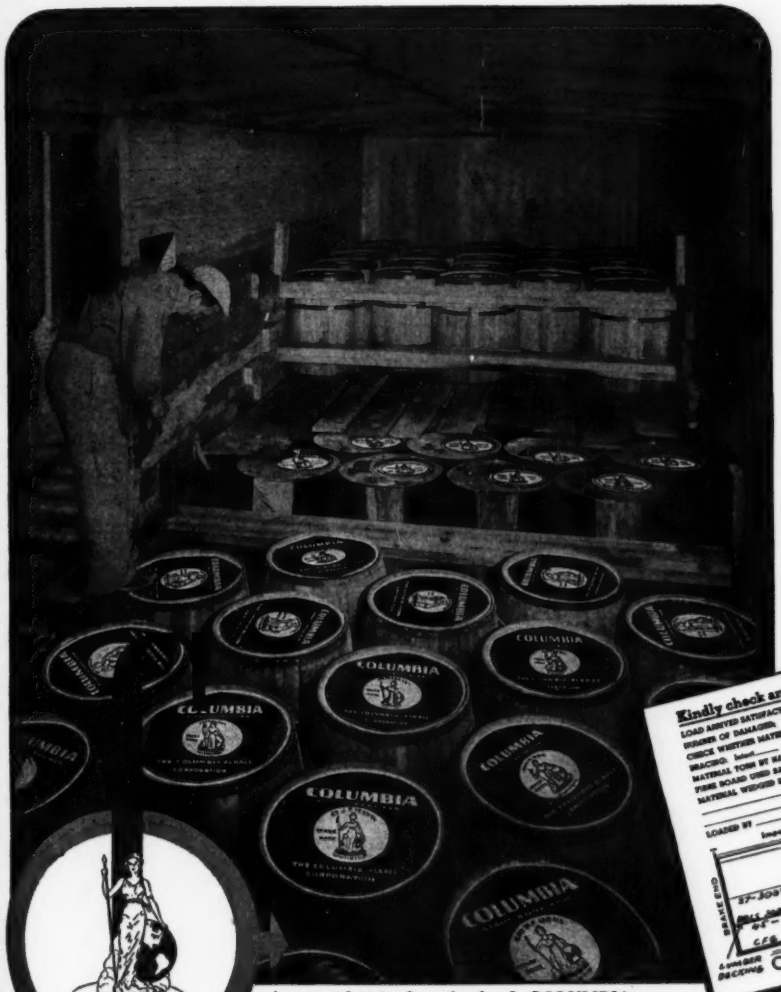
Complain Against Wall Paper Mills

WASHINGTON, D. C., September 11, 1940—Misrepresentation in the sale of wall paper is alleged in a Federal Trade Commission complaint issued against Atlas Wall Paper Mills, Inc., Coal City, Ill.

The complaint alleges that the respondent corporation has disseminated misleading representations regarding the character and qualities of certain of its product. Among and typical of such representations, the complaint continues, are use of the words "washable," "water resisting" and "colorfast," and the legend "printed with the best non-fading colors obtainable."

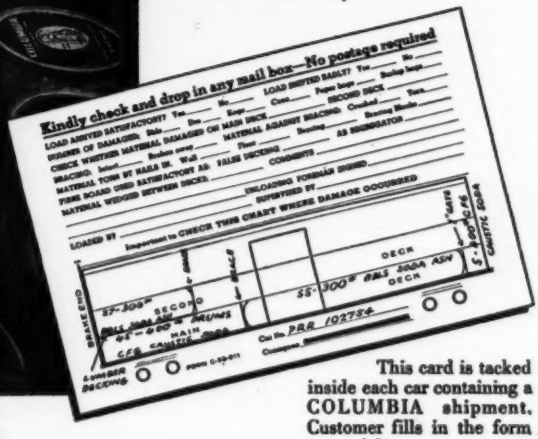
Through the use of these and other similar representations, the complaint continues, the respondent represents that certain of its wall paper may be washed or cleaned by using water, without damage or loss of appearance; that the paper is capable of resisting the usual effects of water; that the colors printed on the paper will not fade, and that the paper is unaffected by exposure to sunlight, when such are not the facts.

Are You Enjoying These Benefits of *Scientific* Packing?



An actual mixed carload of COLUMBIA Flake Caustic and Light Soda Ash being inspected by the loading foreman just prior to sealing of car.

A shifting cargo may not cause a wreck upon the rails as it does at sea, but serious damage to valuable freight often results from lack of scientific packing by the shipper. ★ COLUMBIA Alkalies are packed to withstand the roughest treatment a hurried freight crew can give them. Through the coordination of various departments responsible for shipping, a careful study was made of loading methods based on customer report cards like the one here pictured. The bracing in mixed carloads as seen in the photograph is by fixed formula of proven merit. Equally scientific provisions for the protection of your order are made in the packing of bagged goods in cars with drums or barrels, or the loading of tank cars. ★ This "plus" responsibility which we assume saves COLUMBIA users much inconvenience and delay.


Kindly check and drop in any mail box—No postage required

LOAD ARRIVED SATISFACTORY? Yes___ No___ LOAD SHIFTED BADLY? Yes___ No___

DAMAGE OF DAMAGED: Rib___ Side___ Floor___ Center___ Paper bags___ Bulge bags___

CHECK WEATHER MATERIAL DAMAGED ON MAIN DECK___ RECORD DECK___ Torn___

MATERIAL FORM BY HAULS IN: Wall___ Floor___ Bracing___ Cracked___ Bursting Blocks___

FOUND BOARD USED SATISFACTORY AS: FALSE DECKING___ Bracing___ AS SEPARATOR___

MATERIAL WEDGED BETWEEN DECKS: CONTENTS

LOADED BY ___ UNLOADING FOREMAN SIGNED ___

Important to CHECK THIS CHART WHERE DAMAGE OCCURRED — REPORTED BY ___

This card is tacked inside each car containing a COLUMBIA shipment. Customer fills in the form upon delivery.

COLUMBIA

SODA ASH • CAUSTIC SODA
LIQUID CHLORINE
SODIUM BICARBONATE
CALCIUM CHLORIDE
CALCENE & FILLER
MODIFIED SODAS

THE COLUMBIA ALKALI CORPORATION

EXECUTIVE SALES OFFICES: 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

Plant: Barberton, Ohio

CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • CINCINNATI • CLEVELAND • MINNEAPOLIS • PHILADELPHIA

CONSTRUCTION NEWS

Brevard, N. C.—The Ecusta Paper Corporation, manufacturer of cigarette paper, has approved plans for new addition to mill, consisting of a large one and multi-story building and auxiliary structures, to be equipped to double present capacity. Cost is reported in excess of $500,000, including machinery. Erection contract has been let to the Fiske-Carter Construction Company, Masonic Temple Building, Greenville, S. C., and work will be placed under way at once. J. E. Sirrine & Company, Greenville, are consulting engineers.

Menasha, Wis.—The U. S. Paper Supply Company, 59 East Van Buren street, Chicago, Ill., waste paper products, plans two additions to branch storage and distributing plant on Appleton street, Menasha, operated by the Menasha Mill Supply Company, consisting of a two-story and one-story structure, respectively, each about 48 x 80 feet. Cost estimated over $40,000, including equipment. Bids have been asked on general erection contract and work will be carried out at early date.

Chicago, Ill.—The Traver Corporation, 358 West Ontario street, manufacturer of paper products, is taking bids on general contract for a new two-story top addition to plant, recently referred to in these columns, to be 100 x 136 feet, reported to cost approximately $80,000, with equipment. Award will be made soon. William J. Ryan, 43 East Ohio street, is architect.

Elizabeth, N. J.—Peter J. Schweitzer, Inc., 994 Newark avenue, manufacturer of cigarette papers and other special paper products, has completed plans for new one-story and basement addition to mill, estimated to cost close to $50,000, with equipment. General erection contract has been awarded to the D'Elia Building Company, Inc., 2761 Hudson boulevard, Jersey City, N. J., and work will be placed under way at once. J. Di Stasio & Co., 136 Liberty street, New York, N. Y., are engineers; William E. Lehman, 972 Broad street, Newark, N. J., is architect.

Port Edwards, Wis.—Nekoosa-Edwards Paper Company, Inc., manufacturer of writing and other paper stocks, has plans for one-story addition to office and operating building, about 40 x 55 feet, and will proceed with erection at early date. No estimate of cost announced. Donn Hougen, 132 East Grand avenue, Wisconsin Rapids, Wis., is architect.

Los Angeles, Calif.—The W. P. Schulken Paper Products Company, 2501 East 25th street, general paper goods, has filed plans for one-story addition to storage and distributing building, 43 x 80 feet. Cost about $20,000, with equipment. Erection contract has been let to the Western Iron and Metal Company, 2500 Santa Fe avenue.

Buffalo, N. Y.—The National Gypsum Company, 190 Delaware avenue, Buffalo, is running on a capacity production basis at various wall board mills in different parts of the country, including plants at Mobile, Ala., and Bronx, New York, N. Y., where company recently completed an expansion program for this line of production. Recent orders include a Federal contract for about 5,000,000 lineal feet, to be used for housing units at training camps at Fort Dix, N. J., and near Grand Rapids, Mich. It is expected to hold to present capacity operations for a number of months to come.

Williamsport, Pa.—The C. A. Reed Company, Chestnut street, manufacturer of crepe paper specialties, has plans under way for new addition to mill, to be equipped for large increase in present capacity. It will be two-story, 80 x 180 feet, reported to cost close to $100,000, with equipment. Erection is scheduled to begin soon.

Wausau, Wis.—The Minnesota Mining and Manufacturing Company, 791 Forest street, St. Paul, Minn., manufacturer of sandpaper and other abrasive paper stocks, etc., has approved plans for erection of new laboratory building at raw material plant at Wausau, to be about 30 x 30 feet. Superstructure will be placed under way at once. An office building, 40 x 65 feet, also will be constructed. Work will be carried out in conjunction with an addition to the mill, previously referred to in these columns. Toltz, King & Day, Inc., Pioneer Building, St. Paul, is architect and engineer.

Chicago, Ill.—The Frederick Post Company, 3635 North Hamlin avenue, manufacturer of special paper products for drafting room and other technical service, and allied specialties, has plans for group of four one-story and one two-story addition to plant, to be known as Buildings J. K. L. M and N. respectively. Cost reported over $85,000, with equipment. Bids have been asked on general erection contract and award is scheduled to be made soon. Fred Dolke, 189 West Madison street, is architect; Irving K. Brooke, last noted address, is consulting engineer.

Nashville, Tenn.—The Werthan Bag Corporation, 1400 Eighth avenue North, manufacturer of paper bags and sacks, and kindred products, has plans for new boiler house at mill, reported to cost over $40,000, with equipment. Bids are being asked for erection of building, and work will be carried out this fall. M. R. Reese, Vendome Building, Nashville, is consulting engineer.

Kimberly, Wis.—The Kimberly-Clark Corporation, manufacturer of book, catalog and other paper stocks, has let general contract to the Fluor Brothers Construction Company, 48 Otter street, Oshkosh, Wis., for alterations and improvements in Building No. 27 at mill, consisting primarily of interior work, as recently noted in these columns. An award, also, has been made to the Vulcan Manufacturing Company, Fond du Lac, Wis., for structural steel. No estimate of cost announced. Work will be placed under way at once.

Three Rivers, Que.—The St. Lawrence Paper Mills Company, Ltd., Montreal, Que., manufacturer of newsprint, plans expansion and improvements in mill at Three Rivers, including new units and installation of equipment. Cost reported close to $200,000 with equipment. Work is scheduled to be placed under way this fall.

New Companies

Brooklyn, N. Y.—The Serve-U Carton Company, Inc., has been organized with capital of $10,000, to manufacturer and deal in paper boxes and

containers of various kinds. New company is represented by Louis Goldin, 489 Fifth avenue, New York, N. Y., attorney.

Allegan, Mich.—Moulded Fibres, Inc., has been chartered with capital of 25,000 shares of stock, no par value, to manufacture wood fiber products of various kinds. E. W. Delano, Allegan, is principal incorporator and representative.

Los Angeles, Calif.—The Coast Paper and Novelty Company, 819 East Seventh street, has filed notice of company organization, to deal in paper products of different kinds. Benjamin Weinstock is one of heads of company and representative.

New York, N. Y.—The Zip-It Envelope Corporation has been incorporated with capital of $20,000, to manufacture and deal in special commercial envelopes and other commercial paper products. New company is represented by Horowitz & Bernstein, 250 West 57th street, New York, attorneys.

Geo. W. Millar & Co. Buy Building

Geo. W. Millar & Co., Inc. have passed another milestone in their travel of progress. They have just acquired the ownership of the building occupied at 284-286-288-290 Lafayette street and 121-123-125-127 Crosby street, New York City, consisting of six stories and basement. It is prominently located on Lafayette street at East Houston and Prince streets.

This concern, with their familiar Mill-R Brands of widely varied papers, for printing purposes, wrapping and specialties, is now in its 80th year and is progressively advancing.

The officers and management of Geo. W. Millar & Co., Inc. have again shown good foresight, as indicated by the purchase mentioned above.

Champion Opens Atlanta Office

The Champion Paper and Fibre Company announces the opening of a new sales office in Atlanta, Ga., to give more intensive coverage of the South by assigning to Atlanta part of the territories now being served by the company's offices in Philadelphia and St. Louis. The new office is located at 1406 First National Bank Building, and will be in charge of

W. D. Gillespie

W. B. Huger

W. D. Gillespie, and W. B. Huger. In addition to the new Atlanta office, Champion has sales offices in New York, Chicago, Philadelphia, Cleveland, Boston, St. Louis and Cincinnati.

Both Mr. Gillespie and Mr. Huger have been employed by Champion for several years. Mr. Gillespie is going to the new sales office from Canton, N. C., and Mr. Huger from the sales office in Philadelphia.

Plans for Paper and Twine Luncheon

The meetings committee of the Paper and Twine Club has arranged a very interesting program for the annual luncheon in connection with the September convention of the National Paper Trade Association at the Hotel Stevens, Chicago, during September 23, 24 and 25. The luncheon will be held at the Hotel Stevens, at 1:00 P. M. Tuesday, Sept. 24, 1940.

As a speaker for this occasion, J. Edgar Hoover, director of the Federal Bureau of Investigation at Washington, has assigned W. S. Devereaux, special agent in charge of the Chicago District of the FBI of the U. S. Department of Justice to talk.

The other speaker will be Ernest W. Tinker, secretary of the American Paper and Pulp Association, who will give the picture in the paper industry and trade as it exists at that time, under present world war conditions and in the light of the program of the National Defense Council and the armament program upon which we are about to enter.

One very important feature of the luncheon will be the presentation of mementos by the club, honoring seven charter members of the National Paper Trade Association who are still living and active in the paper business, i.e.

O. A. Miller, Central Ohio Paper Company, Columbus, Ohio, (The first President of the National Paper Trade Association and the active force behind the formation of that organization); Col. Thos. F. Smith, Louisville Paper Company, Louisville, Ky.; J. A. Carpenter, Carpenter Paper Company, Omaha, Nebr.; Charles N. Bicknell, Union Paper and Twine Company, Cleveland, Ohio; Joseph Joyce, Empire Paper Company, Chicago, Ill.; John W. Vivian, Cook-Vivian Company, Boston, Mass.; Edward E. Wright, Miller Wright Company, New York, N. Y.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending September 11, 1940

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	36½	33¾	34
Celotex Corp.	7⅛	6⅝	6¾
Celotex Corp., pf.	57	56½	57
Certain-Teed Products Corp.	4⅞	4¼	4⅜
Certain-Teed Products Corp., pf.	25⅜	21	21
Champion Paper & Fibre Co.	23½	22	23
Champion Paper & Fibre Co., pf.	....	....	....
Congoleum-Nairn Co.	18	17	17½
Container Corp. of America	14¾	13¾	13¾
Continental-Diamond Fibre Co.	6⅝	6⅛	6¼
Crown-Zellerbach Co.	16⅜	15⅛	15⅛
Crown-Zellerbach Co., pf.	88	87¾	87¾
Flintkote Co.	15⅞	14¼	14⅜
Robert Gair	3⅛	2⅝	2⅝
Robert Gair, pf.	13⅞	13½	13½
International Paper & Power	16½	14⅜	14⅜
International Paper & Power, pf.	61⅝	58	58¼
Johns-Manville Corp.	70⅜	65½	66½
Johns-Manville Corp., pf.	....	....	....
Kimberly Clark Corp.	36⅜	35½	35½
Mac Andrews & Forbes	29	29	29
Mac Andrews & Forbes, pf.	128½	128½	128½
Masonite Corp.	28½	27¾	27⅞
Mead Corp.	9⅞	9	9
Mead Corp., pf.	....	....	....
Paraffine Companies, Inc.	36½	35¼	35¼
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	18¾	16¼	16½
Rayonier, Inc., pf.	30	28¾	28¾
Ruberoid Co.	15⅞	14½	14¾
Scott Paper Co.	39¾	39¼	39¼
Scott Paper Co., pf.	114	114	114
Sutherland Paper Co.	24¼	23¼	24¼
Union Bag & Paper Corp.	13⅜	11¾	11¾
United Paper board Co.	4⅞	4	4
U. S. Gypsum Co.	76½	72	72½
U. S. Gypsum Co., pf.	180	177	179

New York Curb Exchange

High, Low and Last for Week Ending September 11, 1940

	High	Low	Last
American Box Board Co.	....	....	....
Brown Co., pf.	19¾	19¼	19¼
Great Northern Paper	41	41	41
National Container Corp.	11⅝	11⅜	11⅜
St. Regis Paper Co.	3⅛	2¾	2¾
St. Regis Paper Co., pf.	65¾	64	64¼
Taggart Corp.	3⅜	3¼	3¼

Gaylord Will Submit Plan

Holders of 5½ per cent convertible preferred stock of the Gaylord Container Corporation of record of September 16 will receive notices to permit them, if they elect, to file objections to the proposal of the corporation to obtain bank loans of $5,000,000, it was announced last week.

There are 117,383 shares of $50 preferred stock outstanding, before giving effect to any recent sinking-fund retirement of shares, which have one vote a share, compared with two votes a share on 539,221 common shares.

So long as any of the 5½ per cent preferred stock is outstanding, the company may not (a) increase the authorized amount of preferred stock of the company, which is 147,383 shares; (b) create or issue any class of stock having priority over or parity with the preferred stock; (c) issue any obligations or stock convertible into any class of stock having priority over or parity with preferred stock presently authorized.

Also it may not: (d) consolidate with or merge into any other company; (e) sell, lease or exchange all its property or assets or substantially all thereof; (f) create or assume or permit any subsidiary to assume any funded debt other than purchase money, mortgage indebtedness or refunding or extension; (g) guarantee any obligations or stock of any other company except a subsidiary, if holders of the following percentages of the then outstanding shares of 5½ per cent preferred stock object thereto in writing: Thirty-three per cent if more than 50,000 shares of such stock are outstanding, 40 per cent if 50,000 shares or less and more than 25,000 shares are outstanding, and 50 per cent if 25,000 shares or less are outstanding.

Also the company may not change any of the terms of the 5½ per cent convertible preferred stock unless holders of at least 66⅔ per cent of the outstanding shares consent in writing to or vote in favor of such change.

Early this year the company announced that it would spend $1,000,000 on expansion of its paper mill in Bogalusa, La. At the close of 1939 it had no funded debt; current assets were $4,277,738 and current liabilities were $958,588.

Trustees for C. B. Daring Co.

Morristown, Pa., September 7, 1940—The C. B. Daring Paper Manufacturing Company of Bridgeport today was under control of two Federal trustees pending outcomes of court proceedings by the concern to make an adjustment with its lien and secured creditors.

Federal Judge Harry E. Kalodner in Philadelphia yesterday appointed Gerald A. Gleeson, former Assistant U. S. Attorney, and William J. McGarrity, representative of one of the creditors, as the trustees and directed them to continue the business until further order of the court.

Affairs of the company were brought under supervision of the Federal Court in proceedings instituted by Lloyd S. Bright, present owner of the business, and his wife, Florence E., who is the daughter of the late C. B. Daring, Norristown, founder of the company, to prevent sale of their real estate holdings in foreclosure proceedings instituted by McDonald Benton, who holds the mortgages.

Judge Kalodner issued a restraining order prohibiting Benton from taking further steps toward foreclosure, and the same order halted a sheriff's sale of the properties set for last Tuesday.

Financial statements filed by the Brights with their petition to the court under chapter 12 of he Chandler Bankrupcy Act, listed liabilities as $48,950 and assets of $115,900. Although there appears to be a surplus of $67,000, they stated they did not have cash or liquid assets available to meet current bills.

The essence of Bright's reorganization plan was an extension of two years for payment of the claims of the lien and secured creditors of approximately $17,500.

Abitibi Bondholders Notified

The bondholders' protective committee, H. J. Symington, chairman, issued on September 3 the following notice to bondholders of the Abitibi Power and Paper Company:

"The 'Plan of Procedure on behalf of bondholders for the purchase of assets of Abitibi Power and

Paper Company, Limited, by a new company', dated March 15, 1939, having been declared operative, and judicial sale of the undertaking, property and assets of Abitibi Power and Paper Company, Limited, having been set for 2:30 P. M., October 16, 1940, pursuant to an order of the Supreme Court of Ontario and the committee having determined that the time for deposit of bonds under the plan will expire at the close of business on Saturday, September 14, 1940.

"Notice is hereby given that copies of the prospectus, dated June 2, 1940, for certificates of deposit of The Bondholders' Protective Committee for First Mortgage Gold Bonds, Series A, 5%, due 1953, of Abitibi Power and Paper Company, Limited, registered under the Securities Act of 1933, as amended and copies of the aforementioned plan and forms for the transmittal of bonds for deposit, may be obtained on application to the secretary of the committee or any of the depositaries or sub-depositaries."

The New York depositary is the City Bank Farmers Trust Company, 22 William Street, New York.

Lansing Machinery Corp. Reorganizes

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., September 10, 1940—The Lansing Machinery Corporation, Inc., has been reorganized with Attorney Roswell Taylor as president. The other officers will include Alfred S. Harris, vice president, and Mrs. Robert Mason, secretary. The reorganization followed the resignation of Edward S. Lansing several weeks ago. He formed the organization in the summer of 1939 but resigned to accept another position. An official of the concern said the manufacture of paper mill machinery would be continued in addition to other equipment. There has been a temporary reduction in the working force because of certain changes which had to be made in the patterns and designs of the machines.

International Declares Dividend

The board of directors of International Paper and Power Company on Tuesday declared a regular dividend of $1.25 a share for the third quarter of 1940, on the company's outstanding cumulative convertible 5 per cent preferred stock, payable September 28 to holders of record at the close of business September 20. Undeclared cumulative dividends on this stock amount to $12.50 a share.

The board of directors of the International Paper Company, which also met Tuesday did not take any action with respect to dividends. However, the International Paper and Power Company has agreed to pay to any of the few remaining holders of the International Paper Company 7 per cent preferred stock, who so wish, a further sum of $1.25 a share against the assignment of that amount of dividends accrued on such stock.

John Zink Addresses Salesmen

BOSTON, Mass., September 9, 1940—At a sales meeting held at 8 o'clock, Saturday morning, at the office of Carter, Rice & Co., Corp., John Zink, vice-president of the Strathmore Paper Company, Springfield, Mass., gave a highly interesting talk on paper conditions. Eb Hughes, sales representative, discussed the new papers for 1941, showing the new Strathmore handbook. Al Gibney, of the Strathmore organization, was also in attendance.

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PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 111 September 12, 1940 No. 11

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

NATIONAL PAPER TRADE ASSOCIATION, annual Fall Meeting, Stevens Hotel, Chicago, Ill. September 23-25.

RECORD INDUSTRIAL ACTIVITY

A great upward swing in industrial activity lies ahead. The present conflict has brought about many changes in Europe and soon must exert a great influence directly upon all Americans. A marked change is impending, the significance of which cannot be appraised now. It may portend a substantial re-arrangement of the social and industrial elements in our national economy. When men are called from their homes and present employment to serve for at least one year in the military forces of the United States, the conflict abroad will be viewed in more personal terms. This change in the duties of men is but one of several which appear inevitable at this date. The four most important changes now expected are the registration of about 11,000,000 men from 21 to 45 years of age and the enlistment of about 1,000,000 men the first year, the rapid acceleration of a national defense program based on a $36,000,000,000 arms budget, and the mobilization of industry, with the possibility of proposals for the conscription of wealth.

It is, of course, impossible at this time, when the House and Senate have yet to decide upon what legislation will be required to insure the success of the proposed defense program, to attempt to analyze the result which these important changes will have upon the future prosperity, the status of private industrial enterprise and the social life of the nation. It seems certain, however, that the preliminary steps already taken and the proposals now being discussed, will result in the largest business boom in history, with the prospect of at least a four-year period of very high industrial activity and a very substantial reduction in unemployment. Although opinion has been expressed that the Administration's armament program will prove to be of only temporary benefit to industry and labor, or a flash in the pan, this opinion does not appear to take into consideration that the huge armament program will probably be continued to completion, even if the European conflict is terminated in 1941 or 1942. Business activity today is above the peaks of 1929 and 1937, and as yet only a small part of this high business volume has been contributed by orders from Great Britain and orders for military supplies to the Government's account. When the full effect of buying for national defense is felt next year, the national income is expected in Administration circles to rise to a new high record level.

In a recent analysis of the cost of the defense plans now existing, it was estimated that expenditures for the fiscal years 1941 through 1946, the cost will aggregate $36,000,000,000, or double the expenditures for national defense during the two years of American participation in the last conflict. Expenditures for 1941, for example, are likely to total $5,000,000,000, for 1942, $8,115,000,000, for 1943, $7,652,000,000, for 1944, $6,451,000,000, for 1945, $4,778,000,000, and for 1946, $4,701,000,000. When it is considered that $500,000,000 a month will be flowing into industry and trade, while at its peak the WPA was utilizing about $140,000,000 a month, and the AAA less than $75,000,000 a month, the stimulating result which the defense spending plan should have on general business activity appears most impressive.

It has been said by good authority that armament expenditures will continue for some years. With the money now appropriated and expenditures already planned, defense spending will rise to more than $8,000,000,000 in the fiscal year of 1942, beginning next July, which is more than $660,000,000 a month for defense. This is a far greater support for American industry than was provided during the last conflict when the Government spent $7,000,000,000 in 1918 on defense and in 1919, $11,000,000,000 a year, to decline to $2,000,000,000 in 1920 and to a little over $1,000,000,000 in 1921, preceding the depression in those years.

The important difference between this defense spending plan and former New Deal spending programs is that the heavy or durable goods industries will be greatly benefited. Out of the $36,000,000,000 planned to be spent, about $24,000,000,000 will go to the durable goods industries, while the remainder will provide the personnel of the Army and Navy with income, food and shelter.

But the consumer goods industries, including paper, will also share in the expected rise in national prosperity, not only for the reason that the heavy industries must hire workers and pay wages, but that the Government plans other expenditures. These other expenditures total about $7,000,000,000 each year and include AAA benefits, WPA wages, social security

payments and debt payments covering government operations. By adding these billions to the defense billions, the total government spending in the current fiscal year is expected to range from $12,000,000,000 to $15,000,000,000 in the next fiscal year, or $5,000,000,000 more than the government has ever spent in peace time. With this great outlay in prospect, the expectation of a steadily rising level of general business activity to a new high peak which should provide the largest national income ever attained, seems a reasonable expectation.

The recent trend toward the conscription of wealth has been cited as a disturbing possibility. The adoption of the Russell-Overton amendment to the conscription bill is a case in point. This bill introduced by Senator Russell, Democrat, of Georgia, gives the Army or Navy power to condemn private factories for government use when the Secretary of the Navy cannot agree with owners on terms of defense contracts. Another piece of proposed legislation of the same order is that advocated by Senator Joss Lee, Democrat, of Oklahoma, who would compel persons worth $1,000 or more to buy 1 per cent Government defense bonds. Counter proposals are expected to these measures and the House is expected to limit government authority to taking over the operation of plants for defense purposes, duly compensating owners, which authority is part of the President's war-time powers under the Defense Act of 1916.

Mathieson Building Chlorite Plant

A new plant, costing approximately $400,000, is being built by Mathieson Alkali Works, Inc., at Niagara Falls, to produce sodium chlorite, the newly developed chemical that promises to have wide use in the wood pulp, textile, and other industries.

Sodium chlorite, though long known as a laboratory chemical, was discovered by the Mathieson research organization to have special properties that make is valuable for use in many processes.

It will bleach kraft wood pulp as white as book paper pulp without weakening the fibers, which cannot be done with the use of hypochlorite, now universally employed for bleaching this product. This makes possible the production of a paper that is much stronger and whiter than anything that could heretofore be produced.

In the textile field, it permits the scouring and bleaching of cotton and rayon in a single operation, instead of in two, and it also makes possible the simplification of other textile finishing operations.

Other industries, such as flour milling, starch manufacturing, and straw hat making, will also be benefitted by the use of the new product.

The new chlorite plant, which is expected to be completed early in 1941, is located near the present Mathieson Niagara Falls plant on Buffalo avenue. The design of the plant gave rise to many difficult engineering and operating problems, and before some of them could be solved, a small experimental plant had to be built and operated for two years. High-grade alloys are largely used in constructing the necessary equipment.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.7%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	93.8%	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	87.1%	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	87.2%	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	.....	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 35 weeks	88.4%	80.7%	69.4%	87.9%	79.2%	69.2%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
July 27	89.7%	July 29	81.7%
August 3	89.4%	August 5	80.5%
August 10	90.0%	August 12	82.9%
August 17	85.6%	August 19	82.9%
August 24	87.4%	August 26	83.3%
*August 31	85.7%	September 2	85.0%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ration Limits	July 27, 1940	Aug. 3, 1940	Aug. 10, 1940	Aug. 17, 1940	Aug. 24, 1940	Aug. 31, 1940
0% to 50%	48	47	46	56	53	42
51% to 100%	248	250	244	228	219	181
Total Mills Reporting	296	297	290	284	272	223

Paperboard Operating Ratios

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	79%	72%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	74%					

Week end. July 27, 1940—74%
Week end. Aug. 3, 1940—74%
Week end. Aug. 10, 1940—74%
Week end. Aug. 17, 1940—73%
Week end. Aug. 24, 1940—74%
Week end. Aug. 31, 1940—74%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

*Preliminary figure.

Minnesota Envelope Co. Expands

[FROM OUR REGULAR CORRESPONDENT]

ST. PAUL, Minn., September 9, 1940—Expanding operations of the Minnesota Envelope Company and Kaplan Paper Box Company has made necessary the acquisition of an additional warehouse. More than 7,500 square feet of storage space has been added to the factory and facilities, according to an announcement by George Kaplan, president and general manager of these organizations, who stated that these enlarged quarters were obtained to improve service provided for customers. The tendency of customers to place contract orders to get the benefit of quantity prices while receiving their merchandise in split deliveries to suit their own requirements has necessitated this increased storage space. This addition climaxes a decade of expansion for these companies, which have made progressive advances each year despite business depressions and economic pessimism.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

A Symposium on Spectrophotometry in the Pulp and Paper Industries*

Introduction to Abridged Spectrophotometers

(Continued from the issue of Sept. 5, 1940)

PAPERMAKER: I see that the spectrophotometer does not get rid of our trouble with standards.

METER: No, but at least it permits you to relate all of your paper standards to a single reproducible standard of magnesium oxide.

PAPERMAKER: I would like to see how the spectrophotometer could be used to tell what to do about these goldenrod samples.

METER: Well, of course, you could have curves of the two goldenrod samples run for a few dollars.

PAPERMAKER: Who does that sort of work?

METER: Electrical Testing Laboratories and the Institute of Paper Chemistry are equipped for it, and I believe the Razek Development Laboratories are too. But I have some curves for two other samples here which exhibit much larger invisible spectral differences than the goldenrod samples. You will be able to see readily from these curves how the spectrophotometer reveals the hidden cause of this trouble. But first satisfy yourself that these grays exhibit the same sort of change as your goldenrod samples.

PAPERMAKER: Now, let's see; in daylight the big sample is off gray quite a lot toward opaline or green and the small one is a warm gray.

METER: Now take them over to the electric lamp.

PAPERMAKER: Yes, you're right! The little sample is still a pretty good warm gray, but the big sample has gone dark and shifted color. It's not even on the green side at all any more, it's purplish, off toward manganese. Why it isn't any good at all! Let me look at it again in daylight. This is the worst color I *ever* saw.

METER: This sample was printed up for the purpose of showing how important the illuminant can be. I got it from the Macbeth Daylighting Co.

PAPERMAKER: (back in the daylight) Yes, the big sample has changed from a purplish gray or a sort of mauvette back to opaline. And say, these samples are rather spotty. That's funny; they were uniform enough under the electric light.

METER: Where are the spots?

PAPERMAKER: (pointing) There's a purple spot right in the middle of the big sample, and a green one on the edge of the little one. No, now it is in the middle; why! there's a spot no matter where I look. I'm getting dizzy (wiping brow, rubbing eyes); maybe my eyes are giving out. I had better see a doctor.

METER: (laughing) Everybody sees those spots, i.e., everybody that has a normally pigmented eye.

PAPERMAKER: (much relieved) Oh! You had me going for a minute there.

METER: Yes, these spots come from the yellow pigment which is normally present in the center of the eye. As you look from one sample to the other, the center of the eye gives you a fairly good preview of the color change that will be seen by the whole eye with the yellow light of the electric lamp. This is characteristic of invisible spectral differences.

PAPERMAKER: It's the *first* time I ever *saw* an invisible difference.

METER: Well, you have me there. Strictly speaking, for pairs showing exaggerated spectral differences like these, they are not invisible. The yellow pigment in the center of the retina, the macular pigment, it is called, makes some of them visible.

PAPERMAKER: Then for the worst cases I don't need a spectrophotometer (there I said it) to tell me that the wrong dyes have been taken.

METER: That is true, but even in the worst cases your unaided eye will not tell you which are the right dyes.

PAPERMAKER: No, that's the big trouble.

METER: All right. Now look at these curves. This fairly flat curve is the warm gray, and the curve with the bump in it going up high in the long-wave end of the spectrum is the one that shifts hue.

PAPERMAKER: I can see how you might expect trouble from two samples whose curves are as different as that, but how do you know from the curve what dyes to use?

METER: You can't always tell right off. But the low places in the curves generally will identify to an experienced dye man what the dyes are. The wavelengths of the absorption maxima will usually be enough to show what dyes have been used, and the shape of the curve will often indicate roughly the proportions required.

PAPERMAKER: I get a general idea of how it would work. But I would have to hire one expert to run the machine, and another to read the curves; I have to justify hiring these extra men.

METER: You're quite right. And you wouldn't get the spectrophotometer for nothing either! We will

have to make a survey of the optical problems in your organization before we can decide whether a spectrophotometer and an operator would pay. You said yourself a while back that the spectrophotometer could be used to check the final match. We would have to see whether anything could be saved in that way too.

PAPERMAKER: Yes, that's my idea exactly. Do it all the way with the spectrophotometer; eliminate the human eye completely.

METER: Now you're talking! I'm glad to see that you recognize the limitations of the human eye.

PAPERMAKER: I'll trust my eye every time to judge a color match if the dyes are right. But if you have to pick out the right dyes with the spectrophotometer, you might as well let it finish the job. Same curves, same color, no matter what light.

METER: Yes, I think that in many cases you could judge directly from the curves when a match is obtained, i.e., the two curves would be so closely identical that no computation would be necessary.

PAPERMAKER: Sure, same curves, same—, what's that? Computation! What computation?

METER: The computation comes in when the two curves cannot be made closely enough the same by adjustment of the dye components.

PAPERMAKER: That means the wrong dyes have been used.

METER: You might put it that way. But it often works out even with the dyes used before, that minor uncontrollable variations in the dyestuff and the raw material yield curves which cross each other in several places instead of coming to coincidence.

PAPERMAKER: You mean sometimes I will have to adjust the match by eye anyhow? The machine won't tell me?

METER: The spectrophotometer won't tell you without computation. What we do is compute, by regular standardized methods, a specification of the color corresponding to the curve.

PAPERMAKER: Will this specification tell me what the color is? Will it tell me what I see?

METER: Very closely. It will give a specification in accord with an average normal observer. This observer is called the 1931 I.C.I. standard observer, because average normal values for computation were worked out and recommended for adoption in 1931 by the International Commission on Illumination.

PAPERMAKER: Commission on Illumination, eh? I'd feel a lot better about it, if it had been worked out for paper colors instead of lights.

METER: It's been recommended as a standard method by TAPPI, too.

PAPERMAKER: Well, well, it's the first I'd heard of it. So much committee stuff comes out that I can't keep up with it. How long do these computations take?

METER: It depends a lot on how much accuracy is required. Many short cuts have been worked out. One company is working on an automatic mechanical computer to go with the spectrophotometer. Or it can be shortened by graphical and electrical methods.

PAPERMAKER: Mechanical, graphical, electrical, —now I *am* getting dizzy. By the time I get an automatic spectrophotometer, someone to run it and tell what the curves mean, and an automatic computer and maybe someone to run that—

METER: You may never get your money back, eh? But that's where I come in; we will work it all out in advance—i.e., so far as it is possible—so you will be assured of the correct instrument for each job. Many modifications of the spectrophotometer have been designed with the idea of reducing color control to simplest terms for each mill operation. Some of these modifications of the photoelectric spectrophotometer are called abridged spectrophotometers, and some are called photoelectric colorimeters many of which have been on the market, as Dr. Gibson mentioned, for only a short time.

PAPERMAKER: I suppose I ought to try to understand at least the general principles of these instruments. If there is anything to this idea of eliminating the human eye, I ought to go into all of the various ways of doing it.

METER: To keep up with even the main principles of design of the various abridged spectrophotometers and so-called photoelectric colorimeters requires more specialized attention than I am able to give to it. But we have with us J. A. Van den Akker, of the Institute of Paper Chemistry. Dr. Van den Akker has been directing extensive studies of these instruments at the Institute; and so is able, probably better than any one else, to give a survey of abridged spectrophotometers. Dr. Van den Akker:

A Survey of Abridged Spectrophotometers*

By J. A. Van den Akker[1]

Abstract

A survey has been made of abridged spectrophotometers, and a description and a discussion of the uses of these instruments are given.

The modern photoelectric spectrophotometer has almost unbounded usefulness. We have seen how this marvellous instrument aids in the selection of proper dyes for production of paper having color to match that of a submitted sample, and how it may be used to check the accuracy of the color match in thoroughly objective fashion.

In extolling the spectrophotometer we should, however, not lose sight of the fact that there is a class of instruments known as *abridged* spectrophotometers which, in certain specific applications, are almost as effective as true spectrophotometers. To do so would be akin to forgetting about simple inexpensive adding machines and thinking only of elaborate, automatic computing machines, when we have only simple additions to perform. Our reason for discussing abridged spectrophotometers is that instruments of this designation are less costly and can be operated and maintained by persons of modest technical training and background. Possibly two or three of these instruments could be used for their specific purposes in a paper mill, where the use of one

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recording spectrophotometer would be regarded as unjustifiably costly. Even in a large mill in which a recording spectrophotometer is available for both research and production, several abridged spectrophotometers could be effectively used for the control of color of raw materials and the finished paper.

In just what respects does an *abridged* spectrophotometer differ from a *true* spectrophotometer, and what are the specific uses of an abridged spectrophotometer in the pulp and paper industry? There is only one significant difference between the two classes of instruments, and this difference is of an optical nature. In the spectrophotometer, heterogeneous light—i.e., light of all wavelengths—is passed through an optical system comprised of one or two prisms or diffraction gratings at a place in the instrument before or after reflection from, or transmission through, the test sample. This optical system separates the heterogeneous light into its component parts (forms a spectrum), and is so designed that, at any time, only a *narrow* band of wavelengths centering upon any desired wavelength is involved in the measurement of reflectance or transmittance. This light, which consists of a narrow band of wavelengths, is termed monochromatic or spectrum light. In the abridged spectrophotometer relatively wide bands or parts of the spectrum are isolated by passage of the heterogeneous light through optical filters made of colored glass, dyed gelatine, or chemical solutions. Thus the significant difference lies in the width of the band isolated from the spectrum. As a consequence of the difference between the optical systems of the two classes of instruments, there is another important distinction: whereas the wavelength can be varied manually or automatically in continuous fashion, from any given wavelength to any other given wavelength in the case of the spectrophotometer, the number of wavelengths at which measurements can be taken with the abridged spectrophotometer is limited by the number of optical filters. If a spectral reflectance or transmittance curve is desired, the operator of the latter type of instrument must plot on a sheet of graph paper the several measured values at the wavelengths associated with the corresponding filters, and draw a curve through the plotted points. As discussed later, the accuracy of the plotted points depends largely on the nature of the plotted curve and the widths of the bands isolated by the filters.

Instruments Which Employ Optical Filters

Before mentioning some of the specific uses of abridged spectrophotometers, it seems desirable at this point to differentiate between the various instruments which employ optical filters. To the chemist a *colorimeter* is almost invariably a visual or photoelectric instrument equipped with one or more filters for the purpose of measuring the transmittance of chemical solutions and transparent substances. Many such instruments, designed only for the measurement of transmittance, are available; a discussion of these instruments would carry us beyond the scope of this paper. Gibson *(1)* has discussed the requirements that should be met by instruments of this class. A true colorimeter is a visual photometer in which three filters are used for the purpose of obtaining tristimulus values of the color of reflecting and transparent bodies. When, in this type of instrument, greater precision in instrument readings is obtained by replacing the human eye with a photoelectric cell, difficulties are encountered *(2, 3, 4)*. Photoelectric 3-filter instruments are not abridged spectrophotometers, because the widths of the wavelength bands isolated by the filters are too broad, and the filters are too few in number; if the sensitivity of an instrument of this type is sufficient to permit the use of narrow-band filters, the instrument may be easily converted to an abridged spectrophotometer. The term "reflection meter" is a rather broad one, embracing, as it does, any instrument which measures reflectance, irrespective of whether the light involved in the measurement covers a very broad or a narrow wavelength range. For convenience of expression, we shall hereinafter use the term reflection meter in place of abridged spectrophotometer. A "brightness tester" is a reflection meter standardized to read that particular reflectance for blue light which is commonly referred to in the pulp and paper industry as "brightness."

Reference has already been made to the use of a recording spectrophotometer in matching the color of a run of paper to that of a submitted sample. Except in relatively simple cases, a reflection meter is not adequate for this purpose, although it may be said that, for all colors, a good reflection meter would render some definite aid. There are, however, certain applications of spectrophotometry in the pulp and paper industry, the purposes of which are served very effectively through the use of reflection meters. In all mills, a great tonnage of pulp and paper of color to match the mills' own standards is produced. The dyes and other components of the furnish are known. The spectral reflectance curves of paper of different runs of the same grade are, or should be, very similar. Manufacturing variables in the preparation of the pulps, dyes, and other ingredients of the furnish will of course cause small variations in the spectral reflectance curves. However, there will not be the large variations attributable to difference in kinds of dyestuffs that are sometimes encountered when the color is adjusted to that of a submitted standard. In the important case under discussion, the color will remain constant within small limits when the reflectances for the several filters are held within small limits. In short, a good reflection meter is a valuable "control instrument."

All existing reflection meters have in common three sources of errors. Accordingly, the writer feels that our present and future purposes will be best served if we devote the major part of our time to a discussion of these sources of error, and spend the remaining time discussing briefly the characteristics of currently available reflection meters. If we can grasp the principles of operation of reflection meters and list the significant points of design, it goes without saying that we stand in a better position to evaluate critically any new reflection meter which is put on the market. The detailed results of investigations of several currently available reflection meters have been published *(5, 6, 7, 8, 9, 10, 11)*.

Classification and Discussion of Methods

In all reflection meters, light is shone upon the test sample and a standard of reflectance under similar conditions. In most instruments the standard and sample literally occupy the same position, so that the standard is illuminated shortly before or after illumination of the test sample; in certain instruments, however, the standard and sample are illuminated simultaneously, or nearly simultaneously.

After reflection from the sample (or standard) the intensity of the light is measured by a photometric system. The intensity is not measured in absolute units, but in relative units so adjusted that the intensity of light reflected from a properly prepared standard of magnesium oxide is 100.0 units; so measured, we obtain what is commonly referred to as "per cent reflectance." The numerical value of percentage reflectance depends upon (a) the sample, (b) the nature of the light received by the photometric or intensity-measuring system (i.e., the range of wavelengths covered, and the relative distribution of intensity of light over that range) and the manner in which the photometric system responds with regard to quality of light, (c) the range of angles covered and the distribution of intensity of light in that range, for both the incident and measured reflected light, and (d) the nature of the photometric system. In short, the reflectance depends upon the spectral, geometrical, and photometrical characteristics of the instrument. Correspondingly, we may break the instrumental error down into its component parts: spectral, geometrical, and photometrical errors.

Reflection meters may be classified according to their spectral, geometrical, and photometrical characteristics as shown in Fig. 1. The first two spectral types utilize several narrow-band filters; instruments of these types are abridged spectrophotometers. The other two spectral types utilize three broad-band filters; instruments of these types may be termed photoelectric colorimeters, reflectometers, color comparators, etc. The rest of the diagram is self-explanatory; the circles in the third and fourth geometrical types represent integrating spheres, an integrating sphere being a spherical cavity, the inner surface of which is coated with magnesium oxide or other material having very high absolute reflectivity.

Spectral Characteristics and Spectral Errors

According to well established theory, the numerical value obtained when reflectance is measured depends upon the array of curves shown in Fig. 2. Curve A gives the relative energy distribution of the light

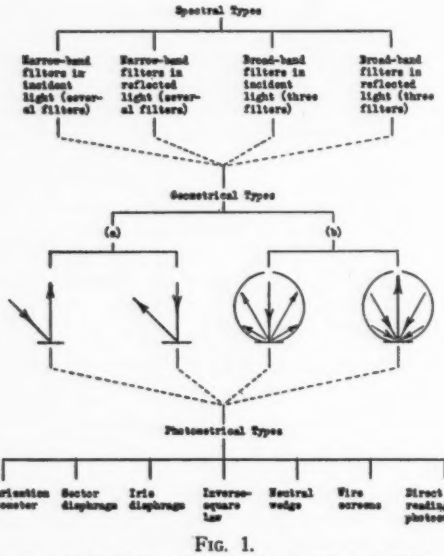

Fig. 1.
Classification of Reflection Meters with Respect to Spectral, Geometrical, and Photometrical Characteristics.

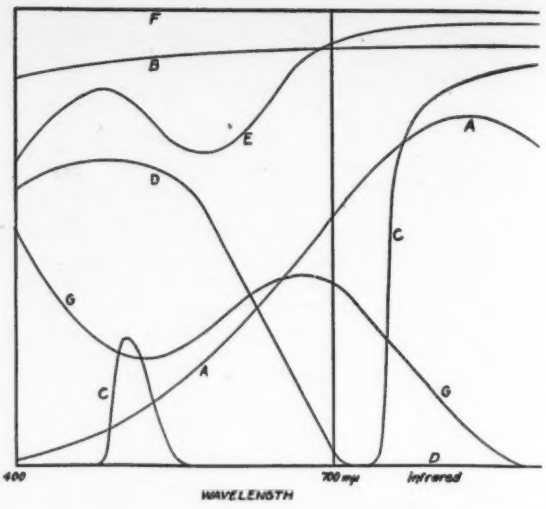

Fig. 2.
Spectral Curves Which Determine the Effective Wavelength of a Reflection Meter: A—Relative Spectral Energy Distribution of Light from Lamp; B—Spectral Transmission of Glass Optics of Instrument; C—Special Transmission Curve of Narrow-Band Filter; D—Spectral Transmission Curve of Infrared-Stopping Filter; E—Spectral Reflectance Curve of Sample; F—Spectral Reflectance Curve of Standard (100.0 per cent Reflectance Assumed for Magnesium Oxide); G—Relative Spectral Response of Photoelectric Cell.

from the light source (usually a tungsten filament lamp); Curves B, C, and D are, respectively, the spectral transmission curves of the glass lenses, the narrow-band filter, and an infrared-stopping filter; Curve E is the spectral reflectance of the test sample; Curve F is the spectral reflectance of magnesium oxide (taken numerically equal to 100.0); and Curve G is the relative spectral response of the photoelectric cell.

The photoelectric current due to the light reflected from the test sample depends upon the area under a curve whose ordinate at any given wavelength is equal to the product of all the curves excepting F at that wavelength. Similarly, the photocurrent due to light reflected from the standard depends upon the area under a curve which is at every wavelength equal to the product of all the curves excepting E at that wavelength. The ratio of these two areas, expressed in percentage, is the percentage reflectance of the test sample. It will be seen that these two product curves are zero at all wavelengths excepting the band of wavelengths passed by the narrow-band filter C and the infrared-stopping filter D. It will also be seen that, if the width of the band becomes very narrow, and converges upon a definite wavelength, the ratio of the areas becomes equal to the ordinate of the spectral reflectance curve at that wavelength, i.e., the reflectance becomes equal to the exact monochromatic reflectance. However, the wavelength band is usually sufficiently broad to give us some pause when we come to plot the measured reflectance against the reflectance scale; at what wavelength shall we plot the reflectance? Some people have plotted at the wavelength corresponding to the peak of Curve C. This practice often leads to appreciable error. It can be shown that the true "effective wavelength," i.e., the wavelength at which the reflectance is equal to the ordinate of the monochromatically determined Curve E, depends upon the shape of this curve as well as upon the nature of all the other curves. Having only the reflection

meter at our disposal, we do not know, *a priori*, the Curve E, and hence we cannot determine the exact effective wavelength. However, we know the effective wavelength, when the spectral reflectance Curve E is a straight line over the wavelength region isolated by the narrow-band filter: it is the wavelength passing through the center of gravity of the area under the curve which is the product of the Curves A, B, C, D, and G, all of which depend only on the characteristics of the instrument. The spectral reflectance curve may have a steep positive or negative slope; nevertheless, if it is straight over the wavelength band passed by the filter C, the reflectance obtained will be equal to that obtained by a similar instrument utilizing monochromatic light of wavelength equal to the effective wavelength defined in this way. This wavelength is chosen for general purposes.

The error in the effective wavelength will depend upon the breadth of the wavelength region passed by the filter C and the deviation of the spectral reflectance curve from a straight line in that region. This type of discrepancy is inherent to the abridged spectrophotometer and is the basis for the major distinction between the ordinary reflection meter and the spectrophotometer.

The effective wavelength of the instrument for a particular filter is modified by a change in shape of any of the Curves A, B, C, D, and G. For example, if the photocell becomes relatively more sensitive to violet and blue light, and less sensitive to light of longer wavelengths, the product curve and, consequently, the effective wavelength, will shift in the direction of shorter wavelength. The error in effective wavelength may be used to describe the so-called *spectral error* of the instrument.

When examining a reflection meter for accuracy and constancy of effective wavelengths, one should inspect the following points:

The lamp. When operated at a light output sufficient for precision of readings, how long will the lamp serve before an appreciable change in Curve A of Fig. 2 occurs? This can be estimated by comparing the operating voltage with the rated voltage of the lamp and noting the normal rated life of the lamp.

Breadth of wavelength band passed by each filter. The major part of the light energy passed by most narrow-band filters is confined in a band of the order of 50 millimicrons (mμ) or less, with the total width of the band of the order of 100 mμ or less. The total width of the visible spectrum is a little greater than 300 mμ. It will be recognized that effective wavelength becomes a very uncertain quantity when the width of the wavelength band is very large. (In instruments which are designed to measure tristimulus values—i.e., colorimeters or color comparators—the filters must necessarily be broad and have spectral transmission closely in accord with definite specifications *(2, 3, 4)*; the concept of effective wavelength is not involved.)

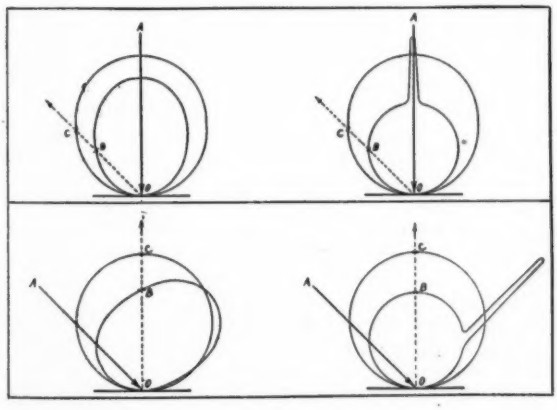

FIG. 3.

Spatial Intensity Distribution Curves for Light Reflected from Magnesium Oxide, a Matte Surface, and a Glossy Surface.

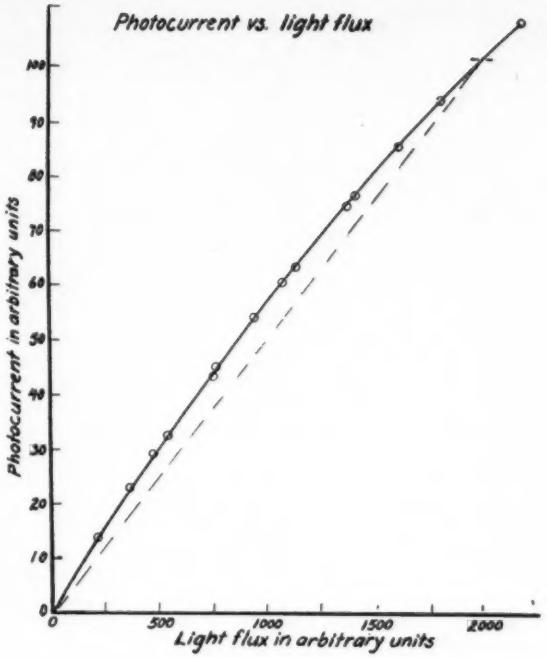

FIG. 4.

Relationship between Photocurrent Produced by a Blocking-Layer Photocell and Light Intensity.

Infrared-stopping filter. If the photoelectric cell is sensitive to light of wavelength greater than 700 mμ, an infrared-stopping filter must be built into the instrument, unless it can be positively demonstrated that the narrow-band filters do not transmit infrared light to which the photoelectric cell is sensitive. Most narrow-band filters have a spectral transmission curve like that of Curve C in Fig. 2—i.e., they transmit infrared light copiously. The infrared-stopping filter should have practically zero transmission for infrared light passed by the narrow-band filters, and it is preferably placed between the sample and photoelectric cell *(5)*.

Filters. Under operating conditions of illumination and temperature the filters and glass lenses should be permanent as regards their influence on effective wavelength.

The photoelectric cell. The relative spectral response (variation of sensitivity with wavelength) of the photoelectric cell over the band of wavelengths passed by any filter should be permanent as regards its influence on effective wavelength. It is not necessary that the absolute sensitivity of the photoelectric cell be constant over long periods of time.

Geometrical Characteristics and Geometrical Errors

All other things being the same, the numerical value of reflectance depends on how the test sample and standard are illuminated and "viewed." This can be understood by reference to Fig. 3, in which are presented diagrams giving the intensity of reflected light for all angles, for magnesium oxide (the almost circular curves), an unglazed paper surface (the oval-like curves in the diagrams at the left), and a glossy paper surface (the remaining curves), for perpendicular illumination and illumination at 45 deg. with the surface. The intensity referred to is the intensity of light on the interior surface of an imaginary sphere having its center at the illuminated point *O*. The diagrams are so plotted that, at any angle, the intensity is proportional to the length of line running from *O* to the curve in question.

As shown in Fig. 1, there are four commonly accepted "geometries" of illuminating and viewing. By the principle of reciprocity, the first two geometries are equivalent, and the third and fourth geometries are equivalent, so that there are, in effect, only two geometries: (a) the surface is illuminated at 45 deg. and the light accepted for measurement is perpendicular to the surface, or *vice versa*, and (b) the surface is illuminated by light perpendicular to the surface, and all reflected light is gathered by an integrating sphere and measured, or the surface is illuminated from all angles by light thoroughly mixed in an integrating sphere, and the light accepted for measurement is that which leaves the surface in the direction of the perpendicular.

Referring to Fig. 3, reflectance obtained by geometry (a) described above is the ratio of the segment *OB* to the segment *OC*. On the other hand, reflectance obtained by geometry (b) has the following significance: with reference to either of the two upper diagrams of Fig. 3, integration of intensity is performed over all angles of a hemisphere for both the test sample and standard. The reflectance is then the ratio of these two integrations. It is not difficult to understand that, in general, numerical values of reflectance of one and the same sample determined by the two geometries are appreciably different. There is no question as to which reflectance is right; each is "right." One or the other, however, will be the more appropriate in comparing instrumental and visual results because, as is well known, there are large variations in geometry of illuminating and viewing in ordinary inspection of samples. It is clear that, in stating a reflectance, the geometry of illuminating and viewing should be specified if it is not already understood.

In the design of actual instruments an attempt is usually made to arrange the optical system to be in accord with one or the other of the two geometries described above. In actual approximations to geometry (a), the incident and reflected rays are not parallel but cover a range of angles. As a consequence, reflectance is not simply the ratio of the segments *OB* and *OC* (Fig. 3) but is the ratio of integrations performed over the corresponding ranges of angles; without going into mathematical detail, one can see that these two ratios will not be quite the same. If the ranges of angles covered by incident and reflected light are small, the numerical value of reflectance will agree quite closely with the ideal value. However, if the angular ranges are so large that specularly reflected rays are included with the diffusely reflected light, an appreciable geometrical discrepancy will result. A similar discussion holds for instruments utilizing integrating spheres. The most common defects of existing integrating spheres are found in the size of openings (relative to diameter of sphere) for sample (and standard), photoelectric cell, light beam, and the absolute spec-

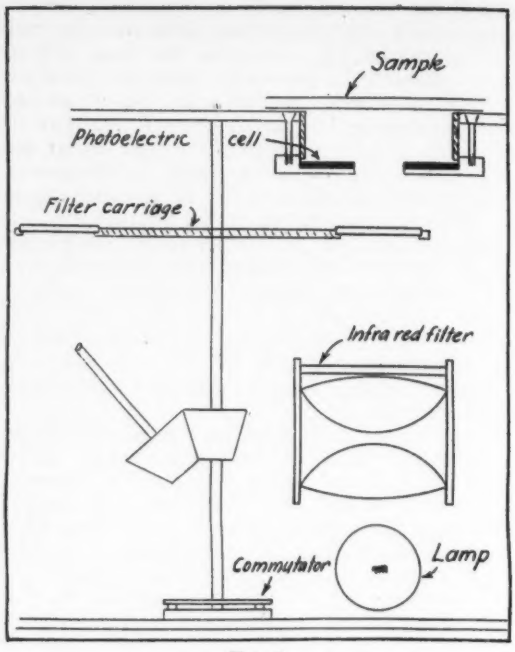

Fig. 6.
The General Radio Color Comparator.

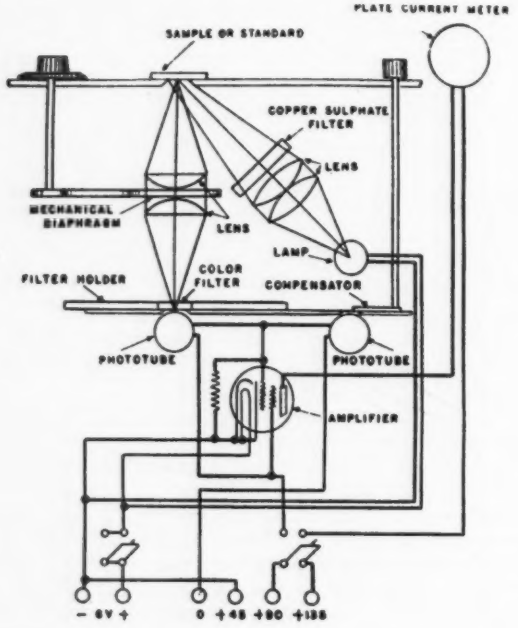

Fig. 5.
The General Electric Reflection Meter.

tral reflectivity of the inner white lining. If the openings are too large, integration of the light will depart appreciably from that of the ideal sphere. Whereas numerical values of reflectance determined by the two geometries are not greatly different for samples having light color, a reflectance determined by a peculiar and unorthodox combination of the two geometries may be so greatly different as to be useless, where correlation with visual observations is desired. Strong deviations of geometries of actual instruments from the two accepted geometries are usually found where instrumental sensitivity is a major problem, and all factors influencing the sensitivity have been pushed to the limit.

In evaluating the geometry of any given instrument, one should examine the optical system with the view of ascertaining closeness of approach to either of the two accepted systems. In the case of instruments utilizing integrating spheres, attention should be paid to the relative size of openings in the sphere wall. In addition to inhibiting proper integration of reflected light (or mixing of incident light), large openings give rise to a seriously large photometric error in all cases excepting that in which the sample and standard *simultaneously* face the interior of the *same* sphere. This will be discussed in the following section.

Photometrical Systems and Photometrical Errors

The photometrical system of a reflection meter is that part which is designed to measure relative light intensities. Before the advent of the blocking-layer or self-generating photocell, photoelectric instruments were limited to the use of evacuated or gas-filled photoelectric tubes. The great popularity of the newer photocells is due mainly to the fact that, unlike the older phototubes, an external source of potential and an auxiliary amplifying circuit are not necessary. The self-generating photocell has made possible the construction of smaller and more portable instruments. In many photometric applications, however, the use of the phototube is still preferred. When employed in proper circuits with correctly designed optical systems, the use of either type of photoelectric cell will lead to accurate results.

Probably the most familiar method for measuring reflectance is that which is designated in Fig. 1 as "direct reading of photocurrent." This method has the appeal of being straightforward and, in the case of manually operated instruments, of enabling one to take measurements rapidly. While speed of measurement is highly important, it should not be obtained at too great a loss in accuracy. As a general rule, the method of direct measurement of photocurrent is subject to rather large error (although precision or reproducibility may be very good). In the typical arrangement diffusely reflected light is gathered by the face of the photocell or by a lens which directs the light upon the photocell; the photocurrent is measured by means of a galvanometer. Using incident light of constant intensity, the photocurrent is assumed to be proportional to reflectance. The error involved in this assumption can be estimated from Fig. 4, in which the photocurrent generated by a blocking-layer cell is plotted against light intensity. The error can be minimized by employing a working standard having reflectance nearly the same as that of the sample, but this procedure necessitates the use of several standards and is not invulnerable, unless there is some means for evaluating the working standards. The accuracy of the direct deflection method is said to be improved and sensitivity to temperature changes minimized, when a blocking-layer cell is used in a "zero potential circuit" *(12)*. However, the use of the zero potential circuit involves added operations which might be regarded as too time-consuming for routine work. In certain variations of the direct method, potentiometric means are employed and reflectance is taken proportional to resistance rather than to the deflection of a galvanometer. In a circuit that is currently in use *(13)* the potentiometer current is furnished by a blocking-layer photocell. This circuit minimizes error due to fluctuations in lamp voltage but does not constitute a null photometric method.

Somewhat better accuracy is obtained by the direct method when an evacuated phototube is used with a suitable amplifier tube. In this case the accuracy

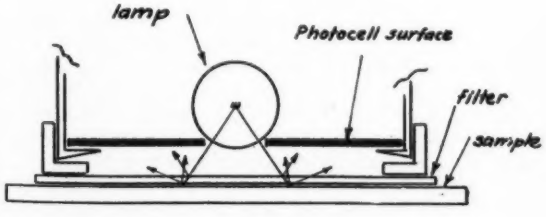

Fig. 7.
The Lange Photoelectric Reflection Meter.

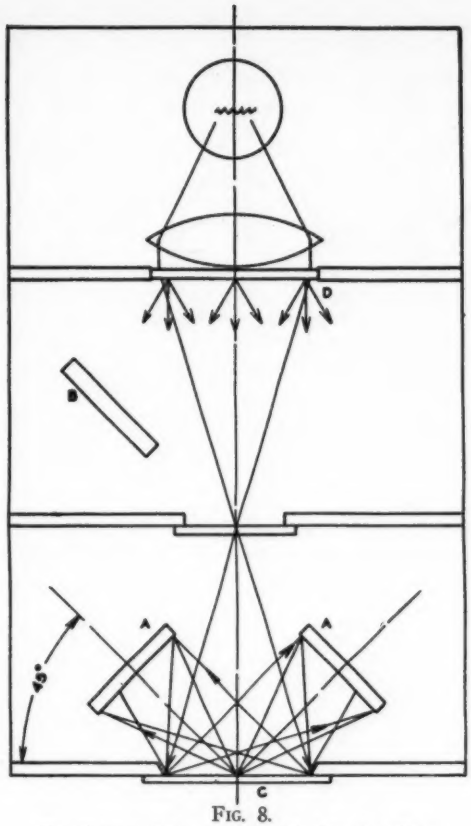

Fig. 8.
The Elmer and Amend Improved Reflection Meter.

appears to be limited by nonlinearity of the plate current-grid potential relationship of the amplifier tube.

In comparing the relative speeds of measurement by different photometric methods it should be pointed out that much of the saving in time by the direct method is more apparent than real. It is often the case that variation of photocurrent due to changes in temperature, circuit potentials, lamp voltage, etc., necessitates an appreciable expenditure of time in checking the "zero" and standard settings.

A higher order of accuracy can be obtained by a photometer based on a null photometric method. A null method requires of the photoelectric system that its indication, initially at some point for a given initial light intensity, will change when the light intensity is changed, and returned to the same point when the light intensity is returned to its initial value, a requirement which is easily met; it is unnecessary to assume linearity of phototube response or of amplifier tube characteristics. The intensity of light incident on or reflected from the sample and standard is controlled by a photometric device. The photometric device transmits light in a manner which is accurately known and independent of light intensity. To illustrate the null method, let us place the photometric device between the sample opening of the instrument and the photoelectric detector. With the test sample in place, we set the photometric device to transmit 100 relative units, and note the indication of the photoelectric detector. A magnesium oxide standard (reflectance, 100 per cent) is then substituted for the sample and, since more light is now reflected, the indication of the detector will increase. By adjustment of the photometric device the amount of light received by the detector is decreased until the indication of the detector is returned to its initial point; it is then seen by reading the photometric device that R relative units are transmitted. Since the light intensities at the detector were the same when sample and standard were over the sample opening, it follows that the reflectance of the sample is equal to R, the percentage reduction in intensity of light after reflection from the standard.

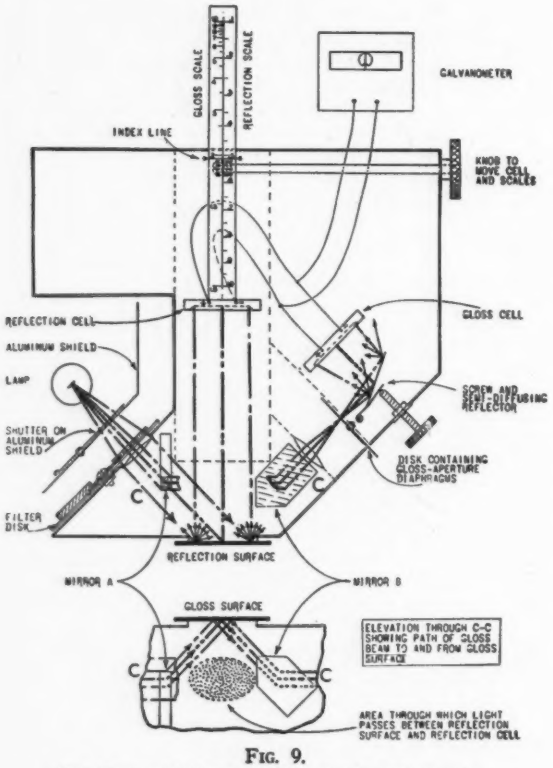

FIG. 9.
The Hunter Multipurpose Photoelectric Reflectometer.

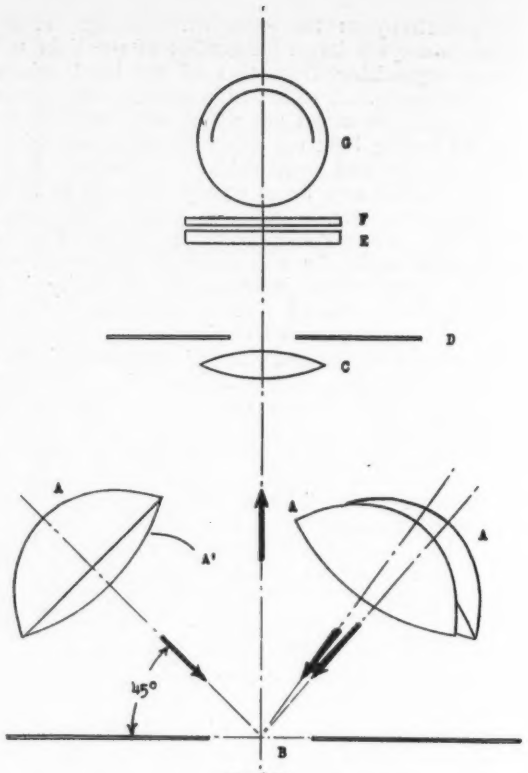

FIG. 10.
The Higgins Reflection Meter.

With the exception of the direct method, the methods indicated in Fig. 1 may be used in null photometers. Without doubt the most accurate of these methods is that of the polarization photometer, the scale readings of which are based on calculations involving exact optical formulas. The scales of photometers based on the remaining methods should be established by calibration. Ideally, the relative amount of light transmitted by a sector diaphragm is proportional to its angular opening, and that transmitted by an iris diaphragm is proportional to the area of its opening, but these relationships should be carefully checked by experiment before they are used for the computation of photometer scales. The inverse-square law forms the basis of a well established method of photometry; in this method, the intensity of light incident on the photoelectric detector is varied by varying the distance between the sample (or standard) and the detector. Since the illuminated area and area of the photocell face are not infinitely small, the inverse-square law does not hold, and calibration of the scale is necessary. The neutral wedge may be literally a transparent but light absorbing wedge, or a transparent plate carrying a light absorbing film, having a transmission

which varies continuously and smoothly from a maximum value at one end of the wedge to a minimum value at the other end. Light intensity of a beam passing transversely through the wedge is varied by moving the wedge across the beam. The wedge must be calibrated, and, unless the wedge is truly neutral or achromatic, it must be calibrated at a number of wavelengths. The wedge must be well seasoned to eliminate the necessity of frequent calibration. The last null method indicated in Fig. 1 would involve the use of a set of screens of known transmission. It is obvious that an instrument employing screens would have limited usefulness, unless the photoelectric system were so designed that its indication could be used for interpolation, in which case the photometric system would no longer be strictly null.

A serious photometric error that is not at all self-evident may be involved in an instrument utilizing one or two integrating spheres. This error is due to the fact that light in the sphere is absorbed by the sample. In consequence of this absorption there is not, as is commonly assumed, a linear relationship between reflectance and intensity of light from the sphere. There appears to be only one type of arrangement of integrating sphere and photometric system in which the error under discussion assumes negligible proportions, namely, that in which apertures are provided in the sphere wall for both sample and standard, and the sample and standard simultaneously face the interior of the sphere; in this arrangement the reduction in level of illumination of the standard (by absorption of light by the sample) is nearly the same as that for the sample. In other arrangements of one or two integrating spheres in which there is one aperture in a sphere for sample or standard, the photometric error may be very large. The magnitude of this error depends upon the relative areas of sphere wall, sample aperture, and apertures for photocell and entrance (or exit) of light, and the absolute reflectivities of the sphere wall, sample, and standard. The error increases with increasing area of aperture and with decreasing reflectance of the sample. A numerical example will show the magnitude of the error. Consider a typical sphere having an inner surface of 1000 cm.^{2} area coated with magnesium oxide of absolute reflectivity 0.97, a sample aperture of 10 cm.^{2} area, and two other apertures of total area 10 cm.^{2} (assumed black). Let the standard be

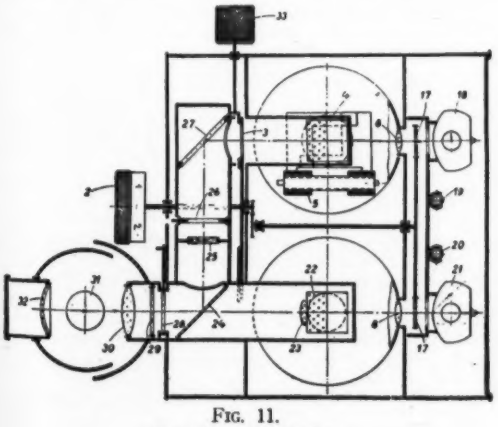

FIG. 11.
The Zeiss Leukometer.

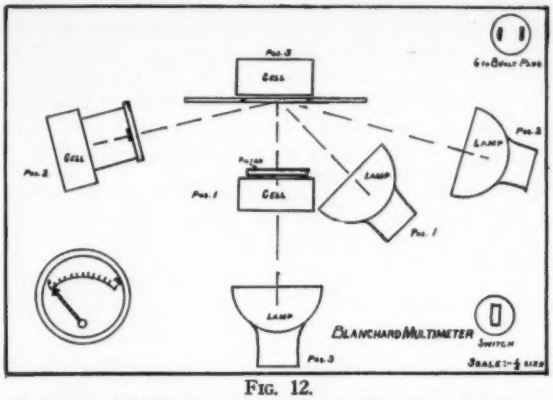

FIG. 12.
The Blanchard Multimeter. Position 1—For Reflection or Color Reading. Position 2—For Gloss Reading. Position 3—For Opacity or Transmission.

magnesium oxide, and suppose that the absolute reflectivity of the sample is 0.70 (72.2 "per cent reflectance"). Calculation shows that the instrumental reading of percentage reflectance would be about 67.7, a figure which departs from the correct reflectance by 4.5 "points." Unfortunately, corrections to the instrumental scale would not be constant with respect to wavelength (since the absolute reflectivity of the inner surface of the sphere varies with wavelength), nor would they be constant with respect to time. During normal use of the instrument the reflectivity of the inner surface of the sphere will decrease; let us suppose that it decreases from its original value of about 0.97 to 0.94. The instrumental value for the reflectance of the sample involved in the foregoing example will now be 69.5, a rise of nearly 2 "points" above the original value.

In evaluating the photometrical features of a given instrument an attempt should be made to obtain answers to questions of the following sort:

1. What type of measuring system is employed? (*see* Fig. 1)
2. If of the direct reading type, has the reflectance scale been constructed in conformance with the nonlinear relationship between photocurrent and light intensity? If a null photometer is employed, has its scale been properly calibrated?
3. Whether corrected or not corrected, is the reflectance scale sufficiently stable over long periods of time for the purposes of mill control?
4. Does fatigue of the photocell or drift of other origin cause error and waste of time?
5. Do temperature fluctuations produce bothersome variations?
6. If an integrating sphere or other cavity is employed, are the sample and standard alternately placed over the same aperture, or are two apertures provided in the same sphere so that sample and standard simultaneously face the interior of the sphere?
7. Is it possible to read the meter or other indicating device with precision, and will the instrument demonstrate good "reproducibility" of readings? (Many users of reflection meters in the pulp and paper industry desire a precision of about 0.3 per cent, although the precision required naturally depends upon the use to which a reflection meter is put.)

Some Currently Available Reflection Meters

A large number of instruments may be listed under the general heading of "color." In view of the definite preference of the technical men of the pulp and paper industry in this country for photoelectric instruments, this paper has been greatly simplified by omitting discussion of visual instruments, some of which serve excellently for research and other specialized purposes. A listing of the many excellent photoelectric instruments of design limited to the measurement of transmission of solutions and transparent solids has also been omitted, because we are presently interested in the measurement of reflectance. In the following list of reflection meters, a brief description is given for each of the instruments

for which technical information has been available; the first six instruments have been studied as part of the instrumentation program sponsored by the American Paper and Pulp Association, and the order of listing is the order in which they have been investigated.

GENERAL ELECTRIC REFLECTION METER. FIG 5. *(5, 14).*
General Electric Co., Schenectady, N. Y.
Spectral features: Cell containing copper sulphate solution between light source and sample to remove heat rays and infrared light; filter wheel between sample and phototube (9 filters); infrared-stopping filter between filter wheel and phototube.
Geometrical features: 45-deg. incident light, 90-deg. reflected light accepted by photometer.
Photometrical features: Null photometer consisting of sector diaphragm; 2 phototubes in balanced circuit, one-tube amplifier for amplification of photocurrent.

GENERAL RADIO COLOR COMPARATOR. FIG. 6. *(7).*
General Radio Co., Cambridge, Mass.
Spectral features: Infrared-stopping filter between light source and sample; filter wheel between infrared-stopping filter and sample (3 broad-band filters).
Geometrical features: 90-deg. incident light through hole in annular photocell; most reflected light gathered by photocell and cylindrical mirror.
Photometrical features: Direct reading of photocurrent produced by blocking-layer photocell.

LANGE PHOTOELECTRIC REFLECTION METER. FIG. 7. *(8).*
Pfaltz and Bauer Inc., New York, N. Y.
Spectral features: Broad-band filters placed between sample and light source-photocell combination, so that light passes through filters twice and is reflected by surfaces of filters.
Geometrical features: See Fig. 7.
Photometrical features: Direct reading of photocurrent produced by blocking-layer photocell.

EIMER AND AMEND IMPROVED REFLECTION METER. FIG. 8. *(9).*
Eimer and Amend, New York, N. Y.
Spectral features: Broad-band filters may be placed between the light source and sample; "daylight" filter between light source and sample.
Geometrical features: 90-deg. incident light, 45-deg. reflected light accepted by photocells.
Photometrical features: Direct reading of photocurrent produced by 2 blocking-layer photocells; balanced potentiometric circuit.

HUNTER MULTIPURPOSE PHOTOELECTRIC REFLECTOMETER, Fig. 9. *(10, 15).*
Henry A. Gardner Laboratories, Washington, D. C.
Spectral features: Filter wheel containing several filters, or 3 broad-band filters (for approximate I.C.I. tristimulus values), between lamp and sample; infrared-stopping filter can be used, but photocell not strongly responsive to infrared light.
Geometrical features: 45-deg. incident light, 90-deg. reflected light accepted by photocell; angular spread of reflected light accepted by photocell variable.
Photometrical features: Null photometer employing "inverse-square law" method; 2 blocking-layer photocells in balanced circuit with sensitive galvanometer.

HIGGINS REFLECTION METER. FIG. 10. *(11).*
Charles F. Higgins, R.F.D. 2, Box 61, So. Portland, Maine.
Spectral features: Filter wheel containing several filters, or holder for single filter (optional), between sample and phototube; infrared-stopping filter between sample and phototube.
Geometrical features: 45-deg. incident light from 3 equally spaced small spot lights, 90-deg. reflected light accepted for measurement.
Photometrical features: Direct reading; phototube current amplified by one-tube amplifier, plate circuit of which contains the indicating meter.

ZEISS LEUKOMETER. Fig. 11. *(16, 17).*
Carl Zeiss Inc., New York, N. Y.

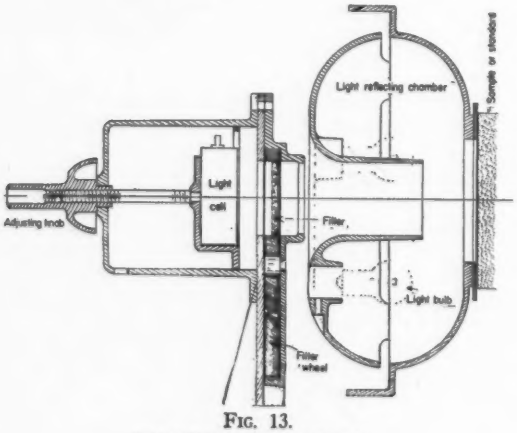

FIG. 13.
The Schoenberg Reflectometer.

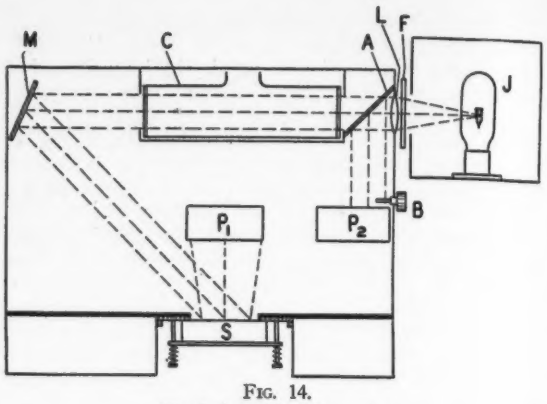

FIG. 14.
The Aminco-Brice Photometer.

Spectral features: Filter wheel interposes pairs of similar filters between 2 integrating spheres and corresponding phototubes.
Geometrical features: 90-deg. incident light, reflected light gathered by integrating spheres (one for standard, other for sample).
Photometrical features: Null-photometer employing "measuring aperture"; 2 phototubes in simple balanced circuit, balance determined with electrometer.

BLANCHARD MULTIMETER. FIG. 12. *(18).*
Koehler Instrument Co., 7409 62nd St., Ridgewood, Brooklyn, N. Y.
Spectral features: Miscellaneous filters can be placed over face of photocell.
Geometrical features: 45-deg. incident light (can be shifted to another angle for specular reflectance); 90-deg. reflected light accepted by photocell (can be shifted for specular reflectance).
Photometrical features: Direct reading of photocurrent produced by a blocking-layer photocell.

SCHOENBERG REFLECTOMETER. FIG. 13.
Light Research Sales Agency, 1443 West Harrison St., Chicago, Ill.
Spectral features: Filter wheel between sample and photocell.
Geometrical features: Illumination from integrating cavity furnished with 3 lamps; 90-deg. reflected light accepted by photocell.
Photometrical features: Direct reading of photocurrent produced by blocking-layer photocell.

BLANCOMETER. *(19).*
Adam Hilger, Ltd., 98 Kings Road, Camden Road, London, N.W. 1, Eng.
Spectral features: Filters between light source and sample, designed to measure approximate I.C.I. tristimulus values.
Geometrical features: 45-deg. incident light, 90-deg. reflected light accepted for measurement.
Photometrical features: Null-photometer comprising calibrated neutral wedges; photocurrent detected by Lindemann electrometer.

AMINCO-BRICE PHOTOMETER. FIG. 14. *(20).*
American Instrument Co., Silver Springs, Maryland.
Spectral features: Miscellaneous filters can be interposed between the light source and sample.
Geometrical features: 45-deg. incident light, 90-deg. reflected light accepted by photocell. (Designed primarily for sugar and powders.)
Photometrical features: Direct reading; 2 blocking-layer photocells in balanced potentiometric circuit.

COLORSCOPE.
Sheldon Electric Corp., 100 5th Ave., New York, N. Y.

BOLTON AND WILLIAMS COLORIMETER *(21).*
Technical Research Work, Ltd., Milner St., London, S. W. 3, Eng.
Spectral features: Cold water in cell between light source and sample, copper sulphate solution in cell between sample and photocell; several filters are employed.
Geometrical features: 45-deg. incident light, 90-deg. reflected light accepted by photocell.
Photometrical features: Direct reading of photocurrent produced by blocking-layer photocell by means of galvanometer with lamp and scale.

Many of the reproductions and line drawings appearing in this paper have been taken from the advertising literature published by the various manufacturers and distributors, to whom acknowledgment is made.

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(13) The Eimer and Amend improved reflection meter. See Instrumentation Studies. XXVIII, *(9)*.
(14) Michaelson, J. L., *G. E. Rev. 38*, no. 4:194-196 April, 1935).
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(21) *Analyst* 62, 3 (1937).

Introduction to TAPPI Survey of Color Instruments

PAPERMAKER: You know, Mr. Meter, I'm beginning to realize that a lot of work has already been done in instruments for color control of paper.

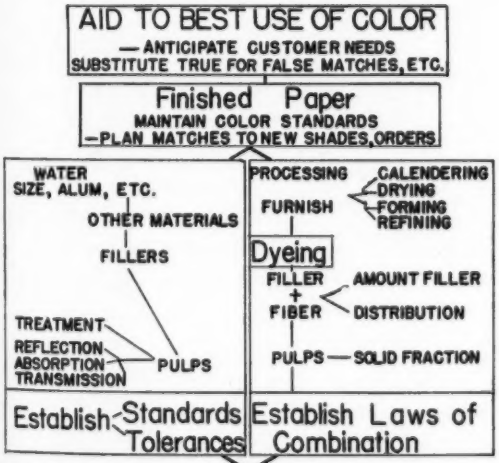
METER: Yes, Dr. Van den Akker and his associates have made a valuable, systematic study. I don't know of another industry that has treated instrumentation so thoroughly as the paper industry has. This critical analysis will make it easier for me to save you money. Why! if we had to go on sales talk alone, we wouldn't have even a fifty-fifty chance of choosing the right instrument for a given job.

PAPERMAKER: No doubt you're right. I suppose I ought to know all about the subject by now. I've been listening to TAPPI papers on colors at the rate of a couple a year for at least 5 years, and still my ideas of what instruments can do to control color are very hazy. Too many other things to worry about! But I do remember one paper back in 1933 that gave an analysis of places in the paper industry where color problems come up. (See illustration.)

METER: I can see that a complete choice of instruments for your organization is going to take quite a while. We'll have to consider these problems one at a time. Where shall we start?

TAPPI Survey of Color Instruments Used in the Pulp and Paper Industries

The active interest of the pulp and paper industries in the use of instruments for the measurement and control of color is demonstrated by a survey of a number of mills in this country and Canada made by the Technical Association of the Pulp and Paper Industry. Of the 43 inquiries mailed by TAPPI headquarters, 38 replies were received. The following summarized answers to the questions comprising the inquiry indicate that properly designed instruments for the control and measurement of the color of pulp and paper are finding increased application by the industry. The fact that nearly 90 per cent of the replies showed their interest in the use of a more satisfactory instrument, if it could be found, demonstrates the trend of technical control and measurement in the manufacture of pulp and paper.



By control testing is understood the routine measurement of pulp, paper, and fillers, such as the determination of brightness. Color measurement usually involves a more thorough measurement of the color of the product for research, grading, reference standard, or other purposes, such as the determination of the spectral reflectance of the material.

1. Question: Is color a problem in your mill?

Answer: Of the 37 replies to this question 89 per cent were in the affirmative. In several instances emphasis was laid on the fact that color was a problem of major importance.

2. Q.: Do you use any type of color control instrument for pulp or for paper?

A.: Of the 33 answers to this question, 21 mills (66%) use some sort of an instrument for controlling the color of pulp. For control in the manufacture of paper 68 per cent of the replies indicated the use of instruments.

3. Q.: Do you depend entirely on visual color matches?

A.: Fifty-nine per cent do depend entirely on visual color matches. The remaining 41 per cent use instruments either for all papers, or only for white papers in which case colored papers are matched visually.

4. Q.: Are such matches generally satisfactory?

A.: Sixty-four per cent indicated that visual color matches were reasonably satisfactory; 18 per cent were of the opinion that such matches were only fairly

satisfactory, while 18 per cent stated that visual matches were not satisfactory.

5. Q.: If a satisfactory instrument could be found, would you use it?

A.: Eighty-eight per cent of the replies were in the affirmative; 6 per cent were doubtful, and 6 per cent replied in the negative. For about 17 per cent of the affirmative group, the cost of the instrument would be an important and perhaps deciding item.

6. Q.: If you use control equipment, what type do you use?

A.: Of the 30 answers to this question, 29 mills use some form of instrument or instruments for control purposes. The distribution is approximately as follows:

(1) Brightness meters	38
(2) Colorimeters	6
(3) Recording spectrophotometers	5
(4) Abridged spectrophotometers (also some brightness meters)	3
(5) Color comparators	8

7. Q.: Was your equipment purchased commercially?

A.: Seventy-nine per cent of the replies indicated that some or all of the control equipment was purchased commercially.

8. Q.: Was any equipment made by your mill?

A.: Forty-four per cent of those answering this question built some of their own equipment.

9. Q.: Was your equipment designed by your mill?

A.: Of the 22 replies, 8 (36%) indicated that a part or all of the control instruments now in use were mill-designed.

10. Q.: How many color measuring instruments do you have?

A.: Seventy-seven per cent of the 30 replies indicated the use of one or more color measuring instruments per mill.

11. Q.: Have you ever used color measuring instruments?

A.: Of the 28 replies, 86 per cent indicated the use of color measuring instruments either in their own mills or at other places.

12. Q.: If so (see 11), what type?

A.: The replies showed that 5 recording spectrophotometers and many brightness meters with filters are being used for color measurement in the industry. Other instruments increase the total to a possible 34 for this purpose.

13. Q.: Have you ever developed, or tried to develop, an instrument suited to your needs?

A.: About a third of the 31 replies indicated that attempts have been made to develop instruments suited to specific needs.

14. Q.: What department in your mill was responsible for the development?

A.: The technical, research, or physics departments.

15. Q.: If a description has been published, give literature reference.

A.: Most of the instruments are described in the papers comprising this symposium.

16. Q.: Are you now using this instrument you developed?

A.: Of the 12 replies to this question, slightly over half of the instruments developed are now in use.

17. Q.: Is it satisfactory for the purpose?

A.: In 73 per cent of the replies the mill-developed instrument was satisfactory.

18. Q.: Are other mills using similar instruments?

A.: In six other mills these mill-designed instruments are being used.

19. Q.: Where are color measuring instruments used in your mill and for what purpose?

A.: About 12 mills use color measuring instruments, either a recording spectrophotometer or an abridged spectrophotometer (brightness meter with filters), in the manufacture of both pulp and paper, and for research purposes. Four mills have color measurements made by commercial laboratories equipped with recording spectrophotometers. Several mills employ their brightness meters for measuring pulp brightness and as abridged spectrophotometers for measuring the color of paper. A few pulp mills are using their brightness meters as abridged spectrophotometers for measuring the color of pulp.

20. Q.: Have you ever used and discarded instruments for color measurement?

A.: Fifteen mills replied that they have used and discarded instruments for color measurement.

21. Q.: Why? (see 20).

A.: Inadequate, lacking in accuracy owing to poor design of instrument or personal factor, or better instrument now available.

(To Be Continued)

Quick Moisture Determination

Improved equipment for quick moisture determination is featured by Perfecting Service Corporation, Chicago. According to the manufacturer, this improved equipment provides an accurate check of moisture content in from one to three minutes and is so simple that anyone can operate it. The quick check-up possible through this equipment, it is pointed out, enables the machine operator to adjust and

Perfecting Moisture Tester

control machine performance while the paper is being made, thus materially reducing costly spoilage and broke.

As shown in the illustration, this outfit is available with either standard or special calculators. The standard provides a check for paper moisture content up to 20 per cent, while the special calculator for pulp mills can be used to test pulp for moisture up to 75%.

Although introduced only a short time ago, this unit has already won acceptance by the industry, according to the manufacturer.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING SEPTEMBER 7, 1940

SUMMARY

Newsprint .....9,253 rolls

NEWSPRINT

H. G. Craig Co., Inc., ———, Donnacona, 353 rolls.
International Paper Co., ———, Gatineau, 284 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 387 rolls.
International Paper Co., ———, Gatineau, 239 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 343 rolls.
H. G. Craig Co., Inc., ———, Donnacona, 376 rolls.
———, ———, Comeau Bay, 7,271 rolls.

RAGS, BAGGINGS, ETC.

Brandwein, Mazur Co., ———, Shanghai, 200 bls. cotton waste.

GLUE BONES

———, ———, Santos, 4,064 bags.

BALTIMORE IMPORTS

WEEK ENDING SEPTEMBER 7, 1940

American Cyanamid & Chemical Corp., ———, Buenos Aires, 834 bags casein.

LOS ANGELES IMPORTS

WEEK ENDING SEPTEMBER 7, 1940

———, ———, Shanghai, 80 tons cotton waste bagging.
———, ———, Yokohama, 1 cs. surface coated paper.
———, ———, Osaka, 3 cs. stencil paper, 1 cs. hanging paper.

New Zealand Import Rulings on Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 6, 1940—Import licenses for the third period in New Zealand which normally would have expired on August 31 next are to be regarded as extended until December 31, 1940, that is they will be valid for the entire 1940 calendar year. Likewise, licenses issued for the fourth period will cover the whole year.

Restrictions applicable to paper items are only slightly changed by New Zealand's new schedule. True vegetable parchment and paper, n.e.i., in rolls, which during the third period could be imported from all countries to the value of the imports of such articles during the corresponding period of 1938, is now placed on the list of items in respect to which no allocation is made, but applications will be considered individually.

More U. S. Pulp for India

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 6—United States exporters of wood pulp are expected to improve their position in the Indian market as a result of the current difficulties in obtaining this item from Scandinavia, according to a report from Consul Barry T. Benson, Calcutta. Sweden has been the most important source of India's pulp wood imports, with the United States ranking as the second largest supplier. It is estimated that Indian paper mills consume approximately 60,000 tons annually of different kinds of pulp, about 20 per cent of this total representing wood pulp imports from abroad.

Except in 1938, when two or three newly constructed mills were in favor of using wood pulp in the initial stages of operations, imports of wood pulp into India have tended to decline. As against 13,675 tons imported in 1938, arrivals during 1939 amounted to only 9,300 tons. During the last few years India has imported a steadily increasing volume of rags which enter the country free of duty. Recently some of the larger Indian paper mills have shown an active interest in obtaining supplies of wood pulp from the United States or Canada, a development believed due to the current shortage of newsprint in this market and the mills' anxiety to make the best of this opportunity by manufacturing this product locally.

Imperial Stockholders Meet

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., September 10, 1940—A meeting of the stockholders of the Imperial Paper and Color Corporation was held this week at which officers and directors for the year were chosen. Among the directors reelected were Louis P. Brown, D. H. Cowles, A. P. Brown, A. S. Frazier, G. S. Knapp, K. R. McBride, G. P. Mellen, J. H. Pearsall, J. E. Singleton and M. C. Wilmarth, all of Glens Falls; William Rohe, of New York City, and A. L. Emerson, of Warrensburg. Officers elected by the directors include K. R. McBride, president; D. H. Cowles, vice president; J. H. Pearsall, treasurer, and M. C. Wilmarth, secretary. The report of the treasurer showed a net profit of $737,409.85.

Eastern Corp. Sues Wilding Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

FORT WAYNE, Ind., September 9, 1940—The Eastern Corporation has filed suit for $9,000 judgment on account and for appointment of a receiver against the John Wilding Paper Company, Inc., in superior court here. The plaintiff corporation declares the defendant company owes it $8,473.94 on an open account for merchandise provided and that the defendant is in imminent danger of insolvency.

George G. Cobean Goes With Paper Co. Van Reekum (NewYork) Inc.

George G. Cobean, formerly president of the National Paper Trade Association, has resigned as vice-president and director of Butler Company, of Chicago, of which organization he has been an officer during the past fourteen years. His resignation also applies to other Butler subsidiaries, of which he has also been an officer and director. Among these, he served as vice-president and general manager of Butler American Paper Company, Inc., New York—the export subsidiary of Butler Company. As of September 1, Mr. Cobean has become associated with Paper Company Van Reekum (New York) Inc., 10 Rockefeller Plaza, New York. He will become president of a Pan American subsidiary corporation of the Van Reekum organization, which will engage in the export of American and Canadian papers to Latin American countries.

U. S. Affiliate of World-Renowned Firm

Paper Company Van Reekum (New York) Inc., is the United States affiliate of the world-renowned Papier Maatschappij Van Reekum N.V., formerly of Amsterdam and subsequent to the invasion of Holland, domiciled at Willemstad, Curacao, N.W.I. The principal owners and Managing Directors, Mr. J. Van Reekum and Mr. J. Richard Van Reekum, are also on the Board of the New York Company and are now permanently domiciled with their families in the United States.

Since 1917, the Van Reekum concern has been extensively engaged in world trade in paper, boards and paper products. It has affiliated companies established and operating in London, New York, Bombay, Singapore, Hong Kong and Shanghai, with agencies throughout the world. The idea of operating an affiliated company in New York to engage in the export sale of American and Canadian paper supplies was conceived by the Van Reekum concern several years before the outbreak of the European War, but, of course, since September 3, 1939, the New York organization has been able to develop more rapidly than had ever been expected.

H. Bengtsson Heads New York Company

H. Bengtsson, who is of Swedish nationality, occupies the post of president of the New York company. He has been associated with the Van Reekum concern during the last eight years. He was formerly manager of the London affiliate and has traveled extensively throughout the world in his capacity as General Manager in charge of all commercial activities of the parent company. He has been a frequent visitor to the United States during the last four years for the purpose of preparatory investigations leading to the development of an export organization in New York for the sale of American and Canadian papers. In the course of these activities, he established the New York affiliate in October 1938. Incidentally, Mr. Bengtsson is married to an American lady.

In Modern and Spacious Quarters

The New York company recently moved into modern and spacious quarters at 10 Rockefeller Plaza, where is maintained an efficient, adequate and specialized organization for the purpose of supplying their numerous clients throughout the world with American and Canadian papers, which supplies were previously obtained chiefly in Europe. The Van Reekum concern has always confined their activities to the paper trade, exclusively, and occupies the position of one of the most important exporters of paper in the world markets. Their operations, through affiliated companies in the various territories stated above, have been particularly efficient by reason of the fact that these affiliated companies carry adequate inventories of practically all grades typical for their respective markets.

Will Maintain Headquarters in Buenos Aires

As is generally known by his many friends in the paper industry, George Cobean has had many years business experience and residence in different Latin American countries. He speaks both Spanish and Portuguese fluently and enjoys a wide acquaintance in those countries. Mr. Cobean will be responsible for organizing and directing the management of this organization in the Latin American countries. He will maintain headquarters in Buenos Aires, Argentina, where he lived for many years and to which market he has made two business trips since September 1939.

India Imports Less Wood Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 6, 1940—Of the total consumption amounting to approximately 60,000 tons by the Indian paper mills, roughly 20 per cent is accounted for by wood pulp imports from foreign countries. The remainder consists of bamboo, grass or rag pulp, manufactured in domestic plants.

Imports of wood pulp into India are largely made up of easy bleaching sulphite, although small quantities of bleached, strong unbleached, and other kinds of wood pulp are also imported. Four or five of the old established and larger paper mills provide the bulk of the demand for imported wood pulp, the smaller and more recent ones consuming negligible quantities. Arrangements for the supply of the mills' requirements of wood pulp are made by individual mills direct with foreign sources, there being no established agency for the import and distribution of this commodity to mills in India. Imports of wood pulp into India have tended to decline in recent years. Receipts in 1939 amounted to but 9,300 tons, a decline of approximately 4,000 tons, compared with 1938. Indications are that Indian paper mills are attempting to make themselves less and less dependent on foreign pulp. In this connection, it is of interest to note that there has been a steady increase in the imports of rags and other paper-making materials for the past few years.

New York Paper and Pulp Market Review

Paper Prices Firm In Most Lines With Sales Volume Little Changed This Week—Pulp Market Trend Downward and Contract Prices Expected To Remain Unchanged For Last Quarter.

Office of the PAPER TRADE JOURNAL,
Wednesday, September 11, 1940.

Moderate activity with more or less hesitancy in buying in the wholesale paper market, is reflected in reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week. Trade prospects continue good, with the concensus of current opinion in wholesale circles apparently inclined toward cautious buying in many lines, and with some manufacturers reflecting opinions of uncertainity as to the trend of business during the final quarter of this year.

Although the trend in wholesale trade is upward, gains are rather small, with some mills increasing inventories more than they would prefer. This situation appears to be, however, a more or less normal one, following a period of relatively high production and shipments during the first half of this year, in which a readjustment is now in progress to more nearly balance production with consumption.

The index of general business activity rose to 105.3 per cent for the week ended August 31, from 104.3 per cent for the preceding week, compared with 94.0 per cent for the corresponding week for 1939.

Paper production of 223 mills for the week ended August 31 was estimated at 85.7 per cent, compared with 79.0 per cent for 1939, with 77.5 per cent for 1938, with 80.7 per cent for 1937, and with 81.0 per cent for the corresponding week for 1936.

Paper board production for the week ended August 31 was 74.0 per cent, compared with 73.0 per cent for 1939, with 67.0 per cent for 1938, with 73.0 per cent for 1937, and with 78.0 per cent for the corresponding week for 1936.

Sales volume for the current week is running about 4.0 per cent higher in many lines than at this date last year. Paper prices in general are holding well in most lines, with reports from some quarters of the market indicating a continuation of relatively small price reductions in some grades of paper specialties. As demand improves, this practice of quoting lower than representative market prices through larger discounts, etc., will probably be discontinued, as it has been done on many previous occasions and like conditions of the market.

Mechanical Pulp

The market situation in mechanical pulp is little changed from last week, and continues easy, with the trend downward and prices holding unchanged at prevailing market quotations.

Chemical Pulp

The price situation in chemical pulp is easy with the trend downward. No important change has been reported during the current week. Contract prices for the last 1940 quarter are expected to remain unchanged at prevailing levels and the high spot prices of a short time ago are not likely to be experienced again this year, in the opinion expressed in some quarters of the pulp trade.

Rags

Mill buying of rags continues light, with trading limited to a few grades. No important change from prevailing market quotations has been reported this week. Roofing rags continue moving steadily in good volume.

Old Rope and Bagging

No important change in the old rope market has been reported this week. Supplies of overseas Manila have declined to such an extent that foreign rope quotations are now practically nominal.

Trading in old bagging is reported somewhat more active at this date. No important change in prices has occurred during the current week.

Old Waste Paper

The paper stock market is more active this week and prices have advanced on several of the lower grades of old waste paper. Strictly folded news is higher and currently quoted at from .37½ to .40; corrugated, at from .55 to .60, and No. 1 mixed paper at from .27½ to .30.

Twine

Prices on hard and soft fiber twines continue quite firm. No important change in the market situation has been reported at this date. Trade prospects are considered good for the final quarter of this year.

Japan Imports Less Wood Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 6, 1940—Effect of the European situation on exports of wood pulp to Japan is clearly indicated in the figures published for the month of April. No shipments were received from Finland, Sweden or Norway. Imports from Canada were small, amounting to only 440 short tons, compared with 333 tons received in March. Some increases in imports of rayon pulp from the United States and Manchukuo are noted, although American imports of paper pulp declined slightly compared with March. Japan's inability to obtain supplies of wood pulp from the Scandinavian countries has caused considerable anxiety among rayon, staple fiber, and paper circles. Imports from Norway, Sweden, and Finland during 1939 represented 52.8 per cent of Japan's total imports of wood pulp from non-yen-bloc countries. These supplies are especially important to rayon manufacturers, since Japan is attempting to increase its exports of rayon goods.

In order to make up the deficiency caused by stoppage of Scandinavian imports, increased purchases from Canada and the United States have been expected. Whether Japan will be able to arrange for these imports is still uncertain.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 11, 1940.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Demand reported moderate for the week. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm, with demand continuing moderate at this date. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are reported a little lower for this week. Standard domestic casein, 20-30 mesh, is currently quoted at from 11½ to 12 cents per pound; 80-100 mesh, at from 11¾ to 13 cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at from 11½ to 12½ cents per pound. Quotations on French casein are nominal.

CAUSTIC SODA—Prices on caustic soda are firm and unchanged. Shipments continue in moderate volume. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—The demand for chlorine is reported good. Prices are very firm and continue unchanged for the week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm with prices lower for the week, "G" gum rosin is currently quoted at $1.62 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.60 per 100 pounds, in barrels, New York.

SALT CAKE—Prices on salt cake are firm under a good demand with current quotations continuing nominal. Domestic salt cake is currently quoted at $17 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $20 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Shipments reported in satisfactory volume. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are reported firm and continue unchanged at prevailing market quotations. Pearl is currently quoted at $2.90 per 100 pounds; powdered starch at $3 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported good for this week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.45 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, Eastern mines. Quotations on imported talc are nominal.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	57.00
White Pat. Coated	67.00	"	70.00
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	" 36.50	32.20	" 37.75
85% Rag	....	"	29.90	" 35.00
75% Rag	23.60	" 27.75	24.75	" 29.00
65% Rag	....	"	21.65	" 26.25
50% Rag	17.55	" 21.50	18.70	" 22.75
25% Rag	14.65	" 17.75	15.80	" 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$9.35	@ $11.50	$11.55	@ $12.75
No. 2	8.50	" 10.25	9.65	" 11.75
No. 3	8.05	" 9.25	9.20	" 11.25
No. 4	7.70	" 9.50	8.90	" 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	$10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	Nominal		
Dry	Nominal		
(Delivered)			
No. 1 Domestic and Canadian	45.00	@	46.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	2.85	"	3.75
(On Dock, Atlantic Ports)			
Kraft Bleached	4.12½	"	
Kraft Light & Strong	3.50	"	3.75
Kraft No. 1	3.40	"	3.60
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	3.00	"	3.25
(Delivered)			
Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albanay; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.75	@	7.00
Silesias No. 1	4.60	"	4.75
New Unbleached	6.50	"	6.75
Blue Overall	4.35	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.10
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.15	"	3.30

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	.95	"	1.00
No. 2	.80	"	.85
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

sonoco

PAPER MILL CORES

LOW COST —BETTER QUALITY

For all uses that require an extremely tough, strong, durable product, SONOCO has developed the new RHINO non-returnable paper mill core. Exhaustive tests for breaking and crushing strength and all around toughness indicate its superior qualities.

RHINO NON-RETURNABLE

Returnable Cores
Equipped With
BERMICO* Metal Ends

DURO is a standard core of plus-standard quality. Made from our own especially manufactured paper stock. DURO cores are made standard 3⅛" I. D. These cores are equipped with BERMICO open or closed notch, metal ends to fit 3" shaft. TAYLOR Ends that protect inside of core only, can also be specified.

EN-DURO a super-quality core to meet extra demands for strength and service where needed. This is our highest grade core. All cores will take either BERMICO or TAYLOR Ends which can be furnished lacquered in various colors for easy identification. . . Both DURO and EN-DURO cores have a thick kraft surface cover.

Exclusive distributors
BERMICO (Reg. Trade Mark)
ENDS *and*
BERMICO (Reg. Trade Mark)
FIBRE CORES

Strong cellulose fibers are formed into a homogeneous tube and then especially treated to resist all weather and moisture changes. The Bermico Core is light in weight and extremely hard, strong, rugged. These particular cores have exceptionally long life in either returnable or mill roll service.

*(Reg. Trade Mark)

SONOCO MAKES *EVERYTHING* IN *PAPER CARRIERS*

SONOCO PRODUCTS COMPANY

BRANTFORD ONT. HARTSVILLE S. C. MYSTIC CONN.

SHIPPING POINTS: LOWELL, MASS. HARTSVILLE, S. C.

DEPENDABLE SOURCE OF SUPPLY

COSTS LESS PER YEAR FOR INSTALLATIONS

Users of Palmetto Packing say it lasts several times as long as ordinary packing. Hence PALMETTO Packing is not replaced as frequently. Savings in labor costs of installations are therefore effected, and additional savings are enjoyed through fewer shut-downs. Long fibre asbestos plus complete internal lubrication provide great strength, low friction and long life.

*PALMETTO for steam, air, hot fluids
*PALCO for water
*PELRO for solvents, oils
*CUTNO for alkalis
*SUPER CUTNO for acids
SUPER SHEAT general all-purpose sheet

*Reg. U. S. Pat. Off.

POSITIVE PROOF

Send for a working sample. Compare the service you get from PALMETTO with that of any other packing on the market. You judge the results.

GREENE, TWEED & CO.
SELF-LUBRICATING & SHEET PACKINGS
101 Park Ave., New York, N. Y.
Established 1863

PALMETTO
Reg. U. S. Pat. Off.
PACKING

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light	2.00	"	2.25
Wool Tares, heavy	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads	2.62½	"	2.75
Sisal Strings	2.10	"	2.35
Mixed Strings	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1	2.25	@	2.50
Soft White No. 1	1.80	"	1.90
Soft White Extra	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag	.90	"	1.00
Solid Flat Book	.80	"	.85
Crumbled No. 1	.70	"	.75
Ledger White Stock	1.80	"	1.90
Ledger Stock Colored	1.30	"	1.40
Manila—			
New Env. Cut	1.70	"	1.80
New Cuttings	1.30	"	1.40
Old Kraft Machine Compressed bales	1.50	"	1.60
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue	.70	"	.75
Strictly Folded	.37½	"	.40
Corrugated	.55	"	.60
No. 1 Mixed Paper	.27½	"	.30

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp	.19½	"	—
Fine Polished—			
Fine India	.23	"	—
Unpolished—			
Box	.17	"	—
Paper Makers	.15½	"	—
Tube Rope	.16¾	"	—
Wall Paper	.15½	"	—
Wrapping	.18	"	—
Soft Fiber Rope	.16¾	"	—
Cotton	.16¾	"	—

(Hard Fiber)

Medium Java	.20	"	—
Mex. Sisal	.17	"	—
Manila	.24	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1	.06	@	.06¼
New White No. 2	.03½	"	.04
Light Silesias	—	"	.04½
Silesias, No. 1	—	"	.04
Black Silesias, soft	—	"	.02¼
New Unbleached	.06	"	.06¼
Washable Prints	.02¼	"	.02½
Washable, No. 1	—	"	.01¾
Blue Overall	.03¾	"	.04
Cottons—According to grades—			
Washable shredding	—	"	.01
Fancy Percales	—	"	.03
New Black Soft	—	"	.02¼
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.	.03½	"	.03¾
No. 2 Mixed	.01¾	"	.02
Corduroy	.01¼	"	.01½
New Canvas	.04½	"	.05
New Black Mixed	—	"	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	.92½	"	.95
Domestic No. 2	—	"	.80
Roofing Bagging	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	2.25	@	2.75
Manila Rope	—	"	4.50
Sisal Rope	1.75	"	2.00
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	2.50	"	2.75
No. 2	1.10	"	1.15
Wool Tares, heavy	3.50	"	3.70
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard White	2.50	@	2.55
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White	2.00	"	2.10
No. 2 Soft White	1.60	"	1.75
No. 1 Mixed	.90	"	1.00
Solid Ledger Stock	1.90	"	2.00
Ledger Stock, white	1.75	"	1.80
Ledger Stock, colored	1.25	"	1.30
No. 1 Books, heavy	.85	"	.90
Manila Cuttings	1.75	"	1.80
Print Manila	.60	"	.65
Container Manila	.50	"	.55
Kraft Paper	1.50	"	1.60
No. 1 Mixed Paper	.40	"	.45
Straw Board Chip	.40	"	.45
Binders Board Chip	.40	"	.45
Corrugated Board	.70	"	.75
Overissue News	.75	"	.80
Old Newspapers	.50	"	.55

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.00
No. 1 Soft White	2.00	"	2.25
No. 2 Mixed	.75	"	.80
Solid Ledger Books	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers	.85	"	.90
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, light	.65	"	.75
Crumpled Stitchless Book Stock	.55	"	.65
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News	1.40	@	1.50
No. 1 Kraft	1.35	@	1.40
Extra No. 1 Kraft	1.60	"	1.90
Mixed Papers	.35	"	.40
Print Manila	.50	"	.55
Container Manila	.60	"	.70
Old Newspapers	.50	"	.55
Paper Wool Strings	.95	"	1.10
Overissue News	1.00	"	1.10
Box Board Chips	.40	"	.45
Corrugated Boxes	.40	"	.45
Kraft Corrugated Boxes	1.05	"	1.15
New Kraft Corrugated Cuttings	1.50	"	1.65
Screening Wrappers	.60	"	.70

Bagging

(f.o.b. Boston)

Gunny Bagging—			
Foreign	2.75	@	—
Domestic	2.25	"	2.35
Sisal Rope	2.00	"	2.25
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	—	"	2.40
Domestic	2.25	"	2.40
Soft Jute Rope	3.00	"	3.25
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.75	"	5.00
Jute Carpet Threads	1.50	"	1.75
Gunny Bagging—			
Foreign	2.75	"	2.85
Domestic	2.25	"	2.50
Bleachery Burlap	4.00	"	3.25
Scrap Burlap—			
Foreign	2.45	"	2.50
Domestic	2.15	"	2.35
Scrap Sisal	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy	2.40	"	2.50
New Burlap Cuttings	3.75	"	4.00
Aust. Wool Pouches	3.00	"	3.15
Heavy baling bagging	2.25	"	2.40
Paper Mill Bagging	1.75	"	2.00
No. 2 Bagging	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.03
Fancy Percales	.04	"	.04¼
New White No. 1	.07½	"	.07¾
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	.07	"	—
Silesias No. 1	.05	"	—
New Black Silesias	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached	.07	"	.07½
Blue Cheviots	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls	.04¾	"	.05
New Black, Soft	.03	"	.03¼
Khaki Cuttings	.03	"	—
O. D. Khaki	.03	"	.03¼
Corduroy	.02¾	"	.03
New Canvas	.06¾	"	.07¼
B. V. D. Cuttings	.07	"	.07¼

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	2.75	"	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues	1.50	"	2.00
Old Blue Overalls	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.00	"	1.25
No. 2	—	"	1.10
No. 3	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons	(nominal)		
Dutch Blues	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians	(nominal)		
Old Linsey Garments	(nominal)		
New Silesias	(nominal)		

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books	.95	"	1.10
Blanks	1.50	"	1.60
Krafts	1.40	"	1.50
New Kraft Cuts	1.60	"	1.75
Overissue News	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Roofing Stocks—			
No. 1	.95	@	1.00
No. 2	.85	"	.90

Buys Roanoke Paper Co.

GREENSBORO, N. C., September 9, 1940—Acquisition of the Roanoke Paper Company interests by Dillard Paper Company has been announced by Stark S. Dillard, president.

Negotiations were completed recently although the local firm assumed operation of the Virginia plant August 1. The plant is the largest paper distributing house in southwest Virginia. Purchase price was not announced.

Addition of the Roanoke company brings to four the number of plants owned by the Dillard firm. A branch was established in Greenville, S. C., in 1934 following opening of the firm here in 1926. Another branch was opened in Charlotte in 1937.

With these four outlets, the Dillard Paper Company now ranks as one of the largest distributing paper houses in the South.

In announcing the transaction, Mr. Dillard stated that all former officers of the Roanoke company had been re-elected. They are W. L. Wilhelm, president; D. W. Tice, vice president; and J. Owen Easley, secretary and treasurer. New personnel will be added from one of the three other Dillard houses.

The Dillard plant here is located on Ashe street in the old Mendenhall Lumber Company building which was occupied in 1936 when the tornado destroyed the quarters on West Lee street.

Government Paper Award

WASHINGTON, D. C., September 11, 1940—Whitaker Paper Company has been awarded the contract by the Bureau of Supplies & Accounts, Navy Department, for furnishing blotting and wrapping paper at $6,859.66.